

GUIDE FOR CRISIS RELOCATION  
CONTINGENCY PLANNING

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OPERATIONS PLANNING FOR RISK  
AND HOST AREAS

This document supersedes CPG 2-8-C "Part III:  
Host Area Planning" August 1976 and CPG 2-8-D  
"Part IV: Risk Area Planning" August 1976.

DEPARTMENT OF DEFENSE  
Defense Civil Preparedness Agency

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## Preface

The Guide for Crisis Relocation Contingency Planning was prepared as part of a series of guidelines to assist NCP planners in developing State and local crisis relocation plans.

The Guide represents a third generation of planning guidelines based on the experience gained in applying the predecessor Working Draft Guide in eight pilot projects and the views of the involved planners. This Guide consists of the following four volumes:

- Overview of Nuclear Civil Protection Planning for Crisis Relocation (CPG 2-8-A)
- State ( and Regional ) Planning (CPG 2-8-B)
- Operations Planning for Risk and Host Areas (CPG 2-8-C)
- Updating Crisis Relocation Plans (CPG 2-8-D)

In addition to the above documents the following volumes previously developed and produced by DCPA supplement the guidelines and should be considered as part of the overall Guide:

CPG-2-8-E Organizational Planning for Crisis Relocation  
January 1976

CPG-2-8-F Preparing Crisis Relocation Planning Emergency  
Public Information, February 1977

Research studies that have contributed to the evolutionary development of the Guide are described in the annotated bibliography, Appendix G to CPG-2-8-B and have also been reproduced for use by NCP planners as reference documents.

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## 1. INTRODUCTION

This document provides guidance for detailed planning to carry out and support crisis relocation. It is the third volume in the crisis relocation planning series. The first two volumes provided an overview of NCP planning and guidance for developing State level crisis relocation plans.

In keeping with the phased approach to CRP the State-level crisis relocation will have been completed before beginning the host and risk area planning described in this document. Therefore, the initial allocation of host counties to risk areas will have been made, a preliminary assignment of risk area population to specific host areas will have been completed, and preliminary emergency public information materials will have been prepared for each of the conglomerates.

The Phase I effort described above is intended to provide an early, although somewhat minimal, capability to evacuate risk areas prior to completion of the more detailed planning which, it is estimated, will take several years to complete. Additionally, this phased approach allows the crisis relocation planning to proceed at the more general level while host area surveys are being completed which are needed to provide the level of detailed data necessary for development of the risk and host area plans.

### The CRP Planning Team

The planning procedures contained here are intended for use by a trained CRP planning team referred to throughout the guidance as the "planning team". The core of this team is the Regional and State staff, in-house or contract personnel, who have been assigned the responsibility to develop the CRP's for the State and local jurisdictions. The planning team should solicit and encourage the participation of local government staffs and officials in this planning effort. It is not, however, intended that the guidance be delivered to a local Civil Preparedness official who is then expected to accomplish the necessary planning with his own resources.

The degree to which local staff personnel and officials participate in the CRP will, to a large extent, determine the acceptance and even the adequacy of the plan. CRP is broad in scope and many more disciplines are involved than will normally be available on the planning team. Also, the local knowledge of community characteristics, organizations, and resources can only be partially replicated by a planning team that does not contain local personnel.



## USE OF THE GUIDANCE

DCPA continues to publish a series of planning manuals and research reports that are intended to assist the planning team in carrying out their crisis relocation planning responsibilities. There are currently six volumes of CRP planning guidance available (References 1 through 5) which are described below:

CPG-2-8-A     Overview of Nuclear Civil Protection Planning for Crisis Relocation

This document describes the various civil preparedness programs that are related to crisis relocation and provides the general planning factors and assumptions that are to be used in the planning. The planning process is described with emphasis on the phased approach to CRP. A glossary of commonly used NCP terms is also included.

This document is intended as an orientation document for both planning teams and local officials.

CPG-2-8-B     State (and Regional) Planning

This document describes the statewide planning process beginning with the initial definition of risk areas, allocation of host areas, initial assignment of risk population, identification of essential risk area operations, and the development of the State crisis relocation plan. A bibliography of available reports pertaining to crisis relocation is also included as an appendix.

CPG-2-8-C     Operations Planning for Risk and Host Areas

This document (which is this volume) describes the steps necessary to develop the local risk and host area crisis relocation plans. The organization of the document is intended to facilitate integrated risk and host area planning for each conglomerate. The end product of these planning steps should be local crisis relocation plans that would be adequate to support relocation in a crisis.

CPG-2-8-D     Updating Crisis Relocation Plans

This document provides guidance on the final detailed planning for all levels of State and local government that will be necessary to develop the ultimate capability to support crisis relocation. Its focus is on organizational relocation and development of internal operating plans for the essential emergency services.

It also includes guidance on the update of CSP's for both the risk and host areas. Recommendations and procedures for updating the CRP's is also discussed.

CPG-2-8-E     Organizational Planning for Crisis Relocation

This document differs from those described above in that it is intended for the use of organizations in developing their internal crisis relocation plans. It describes the role of the organization in crisis relocation, how to develop the necessary operations plan, and the employee information plan.

CPG-2-8-F     Preparing Crisis Relocation Planning Emergency Public Information

This document provides instructions on how to prepare public information materials for crisis relocation at the State and local level. Examples of various formats are provided along with material suitable for inclusion in those public information packages.

CPG-2-8-A-1   An Initial (Synoptic) Prototype State Crisis Relocation Plan

This document illustrates the organization and content of a crisis relocation plan for a State. While it uses data from the State of Colorado, it is not the official plan of the State. This prototype plan is structured along organizational lines, however, it is not intended to preclude a plan structured along functional lines.

CPG-2-8-C-1 Prototype Crisis Relocation Plan for Fremont County Colorado

This document illustrates the organization and content of a crisis relocation plan for a host county. As the State plan above, it is a prototype plan for illustration purposes and it does not reflect the actual plan for Fremont County.

CPG-2-8-D-1 A Prototype Risk Area Plan

This document illustrates the organization and content of a crisis relocation plan for a risk area. While it uses the geographical and political characteristics of El Paso County and Colorado Springs, it does not reflect the official plan for that area.

These guidance documents are provided in separate volumes in order to facilitate their use by the planning teams. However, the planning team should review all of these volumes prior to beginning their planning tasks. Even though the material is generally organized in a sequential fashion, there is a great deal of interaction and feedback required in the process. Each volume is intended to be comprehensive in its discussion of the planning steps, however, in the interest of reducing redundancy and the volume of detail in each volume, background material is not duplicated in each volume. For example, the general planning assumptions are contained only in the overview document even though they apply to each of the planning phases.

The planning factors and procedural steps outlined in this document are intended to assist the planning team in accomplishing CRP. They are not meant to be mandatory procedures that must be followed to the letter. Whenever possible, alternative approaches are identified and suggestions made regarding their applicability. The critical concern in accomplishing the CRP is that the resulting plans provide adequate information, instructions, and assignments of authority and responsibility to enable the risk area population to relocate and be adequately supported in the host area. This means that, to the greatest extent possible, all actions required to be taken to effect crisis relocation be anticipated and included in the CRP.

The guidance material is necessarily general and is oriented toward medium-sized risk areas (cities under a million population) and host areas with hosting ratios under 3:1. Therefore, it will provide too much detail for the smaller conglomerates and not enough detail or possibly inappropriate planning techniques for the

very large conglomerates. For larger risk areas or host areas with higher hosting ratios additional guidance is available from DCPA (Reference 6).

Throughout the planning process the CRP planner must exercise his judgment in terms of the appropriate level of planning detail for each element of the Crisis Relocation Plan. For example, in a small host county of 10,000 population that is receiving one or two thousand relocatees, it is not necessary to develop an elaborate reception and care organization with Divisions, Districts, and Sections. Similarly, a risk area of 50,000 to 75,000 population evacuating to adjacent host areas does not normally need elaborate movement plans or special movement control strategies.

## THE PLANNING PROCESS

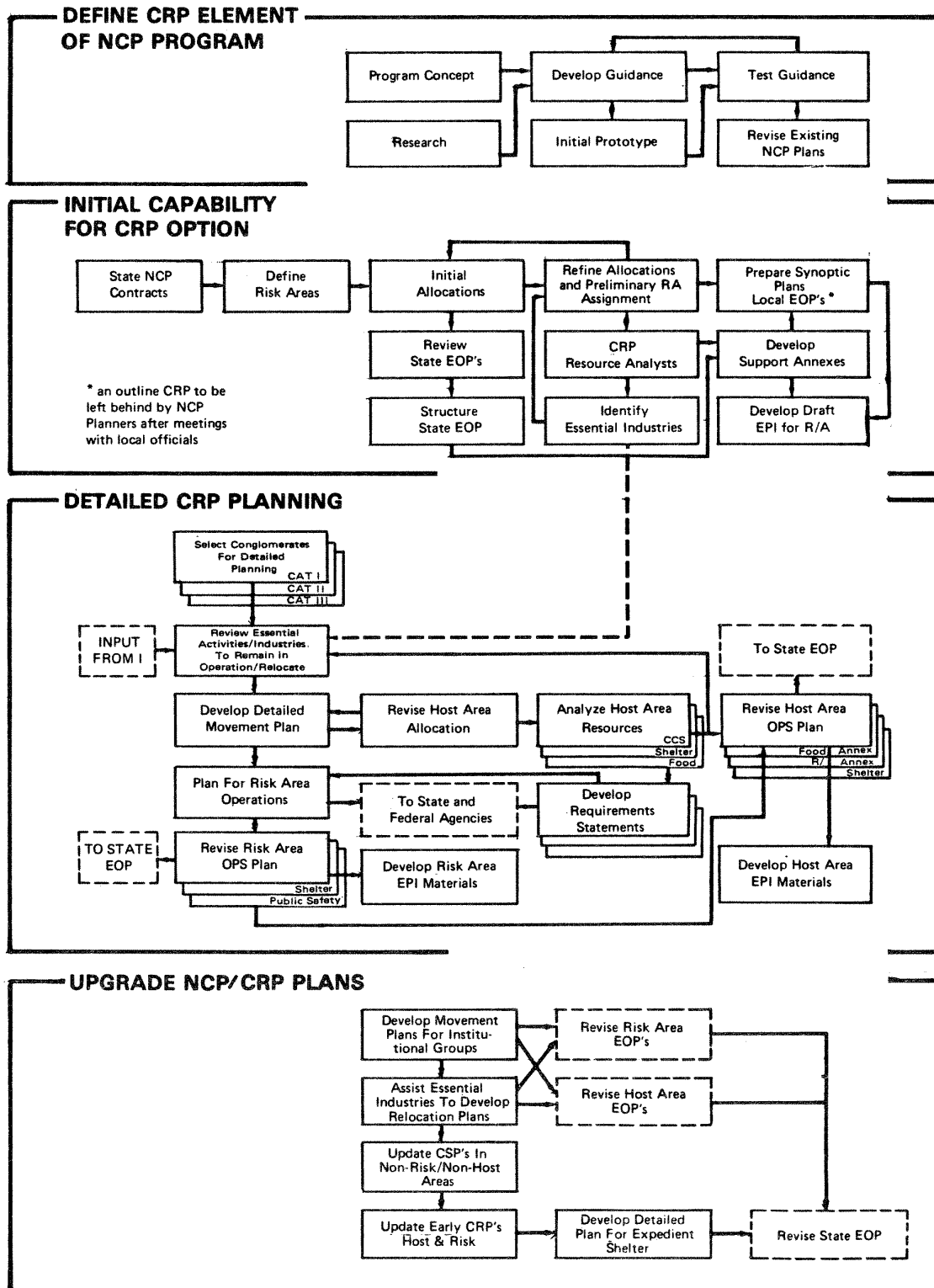
Figure 1-1 illustrates the major CRP planning activities and indicates both the phasing and interrelationships of the planning elements. The initial phase provides the basic structure and authority for the subsequent phases and provides a very limited capability to relocate the risk area population should a crisis occur before detailed plans are completed. The overall State CRP has been completed in preliminary form, host areas have been allocated to each risk area, preliminary assignments of risk population to host areas have been made, and emergency public information materials have been developed to instruct the general public in "where to go and what to do" should relocation be directed.

The second phase, which is the subject of this document, develops the detailed operational Crisis Relocation Plans for the risk and host areas. The development of these plans follows the traditional planning steps of estimating the demand for each essential resource, determining the quantity, location, and suitability of each resource, and identifying the actions necessary to assure the availability of the resource when and where it is needed. At the completion of this phase, the capability should exist to evacuate all of the risk areas and to support the relocated population in the host area for a minimum of two weeks.

The third and final phase in CRP is the refinement and updating of the previous plans. In the interest of obtaining an early capability of supporting crisis relocation at the local level certain elements of the detailed planning, namely organizational relocation, have been deferred until this phase. Organizational relocation is the movement of portions of the risk area population by groups based upon their place of employment.

Figure 1-1

## MAJOR PLANNING ACTIVITIES BY PHASE



## PLANNING REQUIREMENTS FOR RISK AND HOST AREAS

The host area planning is concerned primarily with planning for the reception and care of the relocated and resident population in a host county. This includes planning for movement control, housing, feeding, medical support, supplies and economic controls, fallout shelter, and public safety support.

Since each of these functional elements have a counterpart in or with the risk area, they should be done simultaneously if possible. For example, movement of evacuees is a continuous process beginning in the risk area and ending in the host area. The movement routes may traverse numerous counties and will require a high degree of coordination between the jurisdictions transited.

Wherever possible, the basic plan of action for a functional element should be developed for the entire conglomerate. It is then broken down into jurisdictional components in the process of organizational responsibility and assignments. Ideally, the organizational structure of emergency operations would be totally integrated for the entire conglomerate. It could function as a substate region.

However, from a pragmatic standpoint, this will often not be possible. The autonomy of individual jurisdictions and the lack of day-to-day integration of governmental functions makes such a unified organization difficult. Where Councils of Governments (COG) exist they should be considered as a vehicle for this integration role. Even where the COG's cannot function as an operational entity they should be considered as a valuable resource for data and looked to for assistance in this regional planning.

## SOURCES OF PLANNING DATA

Throughout the planning process there is a continuing need for various types of data. This data can be classified in three broad categories - (1) products from earlier NCP/CRP planning efforts in the State or local area; (2) published resource data from agencies such as Bu Census, State agencies, planning associations, etc., and, (3) DCPA research reports on CRP. The first category of information is listed on Table 1-1, Data Package for Detail Planning, and should be available from or with the assistance of the State civil preparedness office or the Region. The remaining two categories are listed in the reference list in Appendix A. Many of these reports are also contained in the bibliography contained in the Overview volume of this guide (CPG-2-8-A). It will be the responsibility of the planning team to obtain copies of these references from libraries or the publishing agency.

Table 1-1

DATA PACKAGE FOR PHASE II PLANNING

1. Copy of the Phase I planning report (may be designated Part I and Part II planning report).
2. Computer printouts (2) of the results of the Host Area Survey for congregate care space in the host county.
3. Computer printout of NSS space in Host and Risk Areas.
4. Telephone books with yellow pages for host county cities and towns.
5. Detailed maps of conglomerate, host and risk counties and principal cities.

## END PRODUCTS

There are three final products that should result from this phase of planning. The primary product is the draft crisis relocation plan for each of the risk and host jurisdictions. A separate standby package of emergency public information materials is required for each jurisdiction. The third product is the Phase II planning report. An auxiliary product is a checklist for developing and reviewing each of the crisis relocation plans.

The requirements of operations plans are discussed in Section 10 of this document. The checklist contained in Appendix B is intended to assist the planning team in three ways:

1. To provide a device for indicating who is responsible for performing each of the crisis relocation planning activities.
2. To serve as a common reference to ensure that each of the crisis relocation planning elements has been covered in the documented crisis relocation plan.
3. To aid planners in performing an initial review of the crisis relocation plan and periodic reviews in the future.

This checklist is intended to complement the crisis relocation planning guidance, and in no way should it be considered as a substitute for the more detailed guidance that precedes the checklist.

### The Planning Report

The process of developing crisis relocation plans will require an effort of many individuals over a span of a number of years. During that planning period, many decisions will be made that will not necessarily be explicitly stated in the final CRP. Likewise, many alternatives will be considered, some of which will be rejected at the time of the initial planning, because of lack of data or other temporary reasons, even though they should be incorporated into the planning at a later date. The planning report should be used to record this type of information.

There is no particular format specified for this planning report. It is expected that the planning team will develop the format based upon the process they follow in accomplishing the planning. Since it is intended primarily for the use of the current and future planning teams, the planning team should be sure that the report provides sufficiently complete documentation that will permit reconstruction of the process by future planning teams.



The report, to be most useful should follow the same general format as the planning process. That is, there should be an initial section that identifies the input data used, the general assumptions that shaped the plans, and then the specific consideration in each functional element of the plan. It is not necessary to include readily available data in the planning report but it is important to identify the specific source document by title, data, and location. In specifying location, a permanent file should be maintained in the State civil preparedness office which can be referred to with reasonable assurance that the material will be located in the future.

An important element to be included in the report is the documentation of local participation and consultation. The data, place, and participants at conferences and meeting should be listed along with a discussion of the issues reviewed and the final decisions agreed upon. It will be particularly important to document formal approvals of each step in the planning process.

## 2. RECEPTION AND CARE

Planning for reception and care (R/C) of relocatees is an important initial element in the detailed planning for crisis relocation planning. The ability to house and feed the evacuees is essential to the feasibility of crisis relocation and, since this capability is resource dependent, if adequate resources are not available to support the number of relocatees assigned then the initial assignments must be modified.

This section, as well as most of the following sections, is organized in the same sequence that the planning will follow --analysis of demands placed on the host area and the ability of existing host area resources to meet these demands; development of requirements statements in order to obtain any additional resources needed from the risk area; and risk area operations needed to support R/C operations in the host area.

### HOST AREA PLANNING

The first step in building the crisis relocation plan for a host county, parish, or other host jurisdiction (the non-risk part of a metropolitan county or nearby a military base, for example) is to determine where the risk area residents assigned to be hosted are to be housed and fed. Almost all the other planning required -- movement control, medical services, and the like -- depends on the location of the hosted population. Hence, working out the hosting alternatives and selecting a preferred scheme for housing and feeding the relocatees sets the base for the plan. Modifications to the housing plan for relocatees may also require adjustment of the initial assignments made in the Phase I statewide planning.

The basic policy is to house the relocatees in congregate care facilities -- hotels, motels, stores, schools, warehouses, offices, etc., -- rather than in occupied residences. This despite the fact that research and experience in peacetime disasters show that a large proportion of host area families will be willing to share their homes with one or more relocated families. The host area plan should contain arrangements to urge residents to volunteer to take in relocatees.

The principal functions of reception and care are:

- receiving and registering evacuees in host areas
- lodging evacuees in congregate care facilities (and in any private dwellings volunteered by host area residents)

- sheltering the evacuee and resident populations from fallout hazard
- feeding the relocated population distributed in congregate lodging or shelter facilities
- providing other essential services required by special populations or groups such as the aged, the infirm, the handicapped, or families and individuals needing special support during a relocation period.

To accomplish the above functions the CRP planning team must analyze the existing R/C resources and anticipated R/C demand and develop an operational plan. The following steps are recommended for developing the R/C plan:

1. The description and listing of individual host area buildings which can be used as congregate lodging facilities by evacuees - including the congregate lodging capacity of each structure.
2. The designation of fallout shelter and feeding facilities which can be used by evacuees lodged in each building in 1 above.
3. The distribution of the expected (maximum) number of evacuees across the above designated lodging, shelter, and feeding facilities.
4. The designation of special care facilities which will be used by special groups of evacuees posing special needs or problems.
5. The division of the host jurisdiction into R/C Districts and component Lodging Sections, whose headquarters will supervise a manageable number of evacuees and the provision of essential services within each area.
6. The development of a staffing plan and management structure for the R/C Service and its component units.
7. Before and during an emerging crisis, recruitment, orientation, and training for any unfilled staff positions in the host area's R/C organization.

Each of these steps is discussed below with the exception of the designation of fallout shelters which is discussed in Section 4.

## Step 1 - Identification of Congregate Care Facilities

This step involves organizing information about the County's congregate lodging facilities which could be used in an emergency. The results of this step should be an organized listing of facilities which can be matched with the expected relocatees.

### Using the Host Area Survey Results

The survey printouts comprising item 2 of the data package are the basic tools for planning the housing and feeding of relocatees. The host area survey should have resulted in the onsite inspection of every potentially habitable structure in the host county except private residences, farms, and their out-buildings. The structures surveyed include habitable buildings, mines caves, tunnels and highway culverts (in some counties) as the survey is concerned with both housing and sheltering capabilities.

There are two separate listings for the Host Area Survey. One is an all facilities listing which identifies each congregate care facility in order by building number. Since the numbers were assigned consecutively as the buildings were visited, they tend to be grouped together by location. Table 2-1 is a sample of the printout for Placer County, California. The types of information of the printout are:

- number of congregate lodging spaces (40 square feet per space)
- number of fallout shelter spaces (10 square feet)
- "upgradable shelter spaces" - number of shelter spaces after a minimum of shelter-upgrading effort (such as piling dirt against a cellar entrance or lower wall)
- sanitary facilities (and running water) in the building
- whether the structure is heated
- feeding and cooking facilities in the structure
- emergency electrical power available
- health-related facilities in the building

The second listing, Table 2-2, is a summary and analysis of the congregate care facilities by use code. Appendix C provides an interpretation of the abbreviations and codes used in these printouts.

TABLE 2-1

PLACER	CRP HOST AREA FACILITY LISTING AS OF SEPT 30, 1978	PAGE 26938
MCD-PLACE-RSAC- SLA 72RA 0001		
SL-FAC BUILDING NAME	NUMBER R STREET NAME	
00220 PLACER COUNTY HOSPITAL AUBURN	370 ELEM STREET CROSS STREET-- RAVINE ROAD	
00223 PLACER COUNTY JAIL AUBURN	219 MAPLE ST CROSS STREET-- WHITE ST	
00224 PLACER COUNTY COURT HS AUBURN	CROSS STREET-- MAPLE ST CROSS STREET-- WHITE ST	
00225 PACIFIC TEL BUS OFFICE AUBURN	948 LINCOLN CROSS STREET-- ALMOND ST	
00226 PLACER HIGH SCHOOL AUBURN	163 AGARD CROSS STREET-- ROLLINS CT	
00227 PLACER HIGH ADM OFFICE AUBURN	275 ORANGE CROSS STREET-- ROLLINS CT	
00228 PLACER HIGH AUBURN	163 AGARD ST CROSS STREET-- HIGH ST	
00229 PLACER HS S WING AUBURN	163 AGARD ST CROSS STREET-- HIGH ST	
00230 BERNHARD WINERY AUBURN	SACRITO AND HIGH CROSS STREET-- PLEASANT AVE	
00231 PLACER SAVING AND LOAN AUBURN	949 LINCOLN WAY CROSS STREET-- HIGH STREET	
00232 JC PENNY CO AUBURN	908 LINCOLN MY CROSS STREET-- HIGH ST	
00235 PACIFIC GAS & ELECTRIC AUBURN	1050 HIGH ST CROSS STREET-- E PLACER ST	
06027 TELEPHONE EXCHANGE AUBURN	1125 LINCOLN WAY CROSS STREET-- OAKWOOD DRIVE	
06028 TAYLOR TITLE COMPANY AUBURN	1382 LINCOLN WAY CROSS STREET-- COLLEGE WAY	
06029 ST JOSEPH SCHL AUBURN	1102 LINCOLN MY CROSS STREET-- ST HWY 49	
06287 PLACER CNTY HEALTH AUBURN	55 FULMEILER AVE CROSS STREET-- STATE HWY 49	



The survey includes hotels, schools, churches, meeting places, and other readily adapted buildings but also covers retail stores, warehouses, industrial facilities, police and fire stations, utilities, and other categories that may or may not be suitable for housing. Thus, not all of the congregate care space is readily usable. This accounts for the rule of thumb used earlier that discounts up to one third of the space.

Congregate care space is estimated by the surveyor on the basis of 40 square feet per person of usable space. This is a well-established emergency housing criterion that is used, for example, in the aftermath of natural disasters. On the other hand, a shelter space, it should be recalled, is considered to be 10 square feet per person and there is ample experience that people can live under these more crowded conditions for two weeks or more.

In the host counties already surveyed congregate care capacity has averaged about four spaces per resident. However, this ratio varies widely, even among neighboring counties. For this reason, the actual results of the survey are to be used in this phase of planning to adjust the preliminary assignment of risk area residents to particular host counties.

Table 2-3 shows the nationwide statistics on the percent of congregate care spaces found in the use classes accounting for most of the congregate care space. The 23 use categories shown accounted for over 90 percent of the total capacity. For general guidance, the categories have been subdivided into those that ordinarily should be readily available for housing relocatees and those that may have alternate uses during the relocation period or that may not be particularly suitable for housing the relocatees. The subdivision is entirely judgmental, of course, and planning decisions may be required for particular facilities in categories listed as readily usable as well as in categories listed as possibly usable.

In addition to simple space, the next most desirable attribute in buildings used as relocatee housing is the availability of toilets. Schools, Churches, and many places of public assembly usually have adequate facilities for emergency use. Hotels, motels, rooming houses, dormitories, hospitals, and nursing homes usually have an excess of facilities based on emergency standards. These could, in many circumstances, provide such facilities for people housed in neighboring buildings that are deficient in restroom capabilities. Approximately 90 percent of the facilities in the CRP host area data inventory contain toilet facilities. The national average of congregate care spaces per toilet is about 40. Also, about 20 percent of the facilities in the host area inventory contain some cooking capability.

Table 2-3

## RANK ORDER OF USE CATEGORIES IN CRP HOST AREAS SURVEY

		Percent of Total and Availability	
		Readily Usable	Possibly Usable
53	Stores other than food stores		13.6%
61	Factory/plant/manufacturing center		10.3%
22	Junior high/high/prep schools	8.7%	
31	Church/synagogue	6.5%	
54	Warehouses	5.9%	
21	Kindergarten/elementary school	5.7%	
23	Colleges and universities	3.9%	
59	Other commercial		3.9%
51	Commercial offices		3.7%
52	Food stores		3.5%
11	Apartment/hotel		2.7%
41	Hospital		2.7%
49	Other government		2.4%
12	Dormitory/barracks	2.2%	
56	Restaurants		2.2%
45	Government offices		2.2%
86	Automotive repair and storage		2.0%
14	Motels		1.9%
79	Other meeting or amusement	1.8%	
55	Banks/financial institutions	1.3%	
62	Food processing plants		1.1%
57	Contractors/building supplies		1.0%
87	Automotive sales		1.0%
Totals		36.0%	54.2%
Overall Percent of All Space .....		90.2%	



The use categories used in this survey are not entirely satisfactory for congregate care planning but they are so imbedded in the current DCPA computerized inventory of shelter capacity that it would be most difficult to change them. For example, use category 11 is shown in Table 2-3 as "possibly usable" because apartment buildings are lumped with hotels and motels. The latter are readily usable but apartments with permanent residents are really private residences. On the other hand, in resort areas many apartment buildings and condominiums are for rent on a daily or weekly basis. Hence, the planning team, working with a knowledgeable local official, must establish which particular facilities in this use category are readily usable for housing relocatees. As another example, warehouses are of all types. Most would be readily convertible to house relocatees in a crisis but many would be either unsuitable or would be needed to support the relocation operation. The surveyors themselves have had difficulties deciding what use category to associate with many facilities of fraternal organizations, such as American Legion, 100F, Eagles, and the like, many of which have excellent facilities to house and feed people, are likely to be found in several use categories. Nursing homes are also variously identified. One consequent effect is that the "other" categories having a use code ending in 9 must be reviewed carefully by the planning team for their content.

The survey of habitable structures in the host area survey is intended to be complete, but omissions have been found to occur for one reason or another. It is suggested that the planning team review the survey printout from this point of view. Various local agencies can corroborate the number of schools, hospitals, utilities, etc. shown in the printout. The yellow pages of the telephone book (item 3 of the data package) will be useful for checking hotels, motels, and commercial-industrial facilities. In this respect, it is important to keep in mind that the survey covers each building, so there may be several listed for many institutions and firms. They may be listed in several use categories as well.

The planning team may find it useful to make a record of buildings, mines, and caves apparently omitted from the survey, using a format similar to that used on the congregate care printouts.

### Laying Out the Housing Potential

If a substantial portion of the congregate care space identified in the survey printouts (and the supplemental listing developed by the planning team) is not likely to be needed, a preliminary selection of congregate care facilities should be made

and laid out in a way that will permit the planners to gain some understanding of the geographic distribution of the housing potential.

The first step is to identify from the survey printouts the facilities that seem most suitable for housing relocatees. The "ideal" facility is one that is relatively "self-contained" from the standpoint of caring for evacuees. Such a building has (a) some substantial number of congregate lodging space, (b) shelter spaces for at least the number of evacuees in "a" above, (c) water and sanitary facilities, (d) heat - where the climate requires it, and (e) feeding and cooking facilities. If such a building normally lodges people (hotels, motels, etc.), it is probably the best of this highest category.

For ease in showing where the facilities are located in the more populous communities, the city map can be divided into convenient sections, each arbitrarily assigned a number, as shown in Figure 2-1. Areas with many facilities might be divided into six-block sections, whereas sections where facilities are sparse can be much larger. Unless the street numbering system is standard and known, it is usually preferable to draw the section boundaries through the center of blocks rather than down the center of streets so that buildings on opposite sides of the street are in the same section.

As facilities are selected, a tally sheet similar to that shown in Table 2-4, should be prepared for each section, listing the name of the facility, the address, use code, congregate care spaces, existing shelter spaces, upgradable shelter spaces, water, commodes, heat, and cooking facilities according to the survey printout. It is suggested that a running count be maintained of the total congregate care space as it is identified and that facilities be nominated until the total reaches about 20 percent more than is ostensibly required to house the assigned relocatees.

### Step 2 - Designation of Fallout Shelter and Feeding Facilities

Using the tally sheets developed in Step 1, the planning team should identify the potential feeding and shelter facilities for each congregate care facility. Generally, these facilities should be in the same or an adjacent section. In areas with shelter deficits, not all congregate care facilities will be assigned shelter at this point. This will be discussed further in Section 4.

The basic assumption should be that all relocatees will require access to a mass feeding facility, such as a restaurant, cafeteria, school, or the like. In addition, many institutions have kitchens and serving areas that can be used for mass feeding purposes. Among these are colleges, hospitals, homes, of various kinds, hotels and motels, correctional institutions, churches,

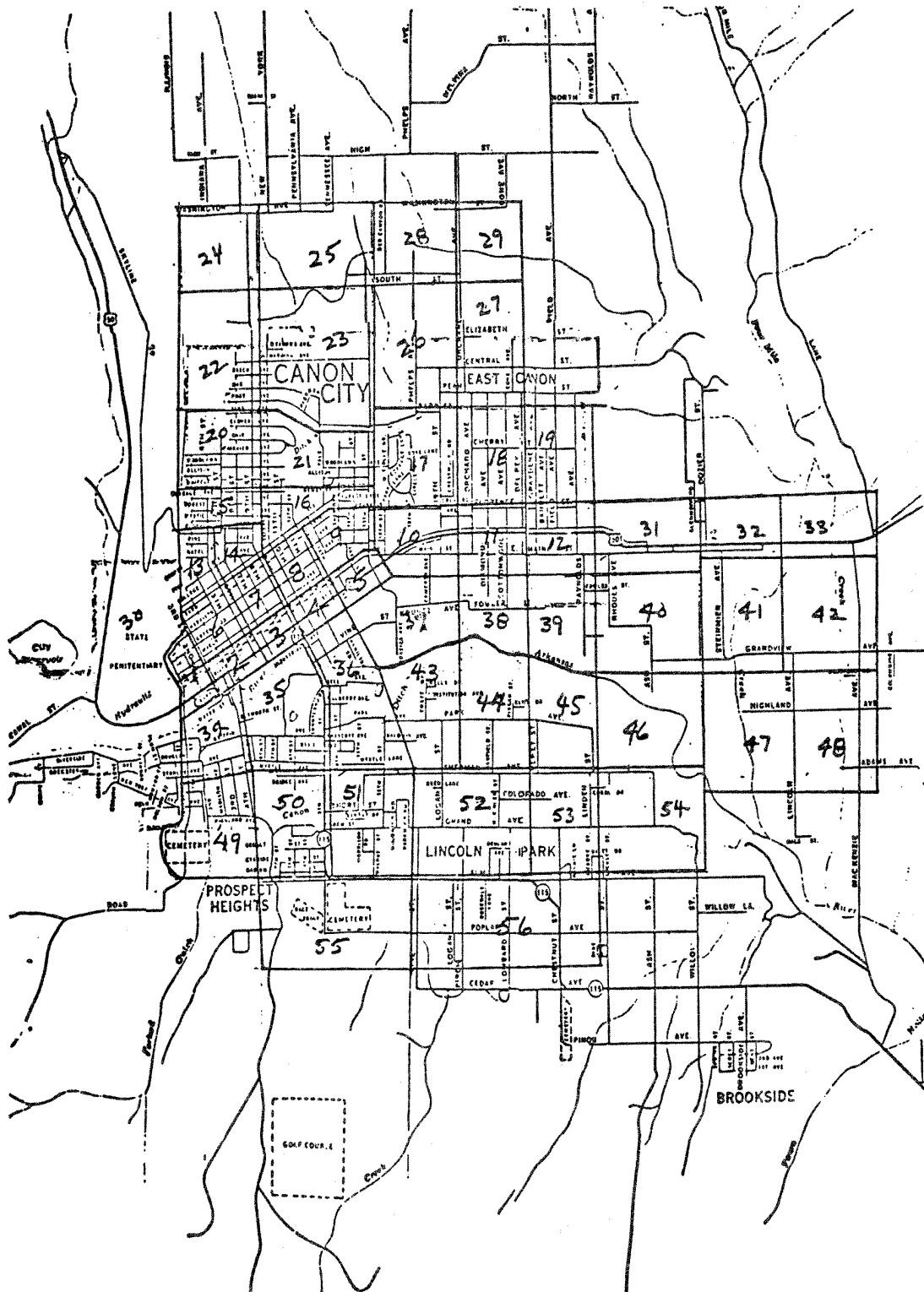


Figure 2-1 EXAMPLE SUBDIVISION OF CANNON CITY, CO

Table 2-4

FORMAT FOR SECTION TALLY SHEET

<u>Section</u>	<u>Facility Name &amp; Address</u>	<u>Heat</u>	<u>Power</u>	<u>Commode</u>	<u>Water</u>	<u>Burners</u>	<u>NSS Spaces</u>	<u>Cong. Care Spaces</u>	<u>Upgradable Shelter Spaces</u>
1	Farmers Insurance 997 Lincoln Way	1	0	2	2	0	0	150	0
	Johnson Toyota 999 Lincoln Way	1	0	2	2	0	0	75	300
	Reeves Motor Co. 1145 Lincoln Way	1	0	1	2	0	0	150	
	Nats Mens-Boys Store 920 Lincoln Way	1	0	1	2	0	0	50	198
	Tahoe Club 902 Lincoln Way	1	0	3	2	29	0	173	160
	Fowlers TV 922 Lincoln Way	1	0	1	2	0	0	160	446
	U.S. Post Office 905 Lincoln Way	1	0	7	2	0	402	290	761
							402	1,048	1,865

industrial plants, and fraternal organizations. It should also be assumed that relocatees must walk between their lodgings and the place where they take their meals. Restaurants are included along with food stores in use category 52 in the survey printout. The telephone yellow pages will be useful to check the completeness of the survey information. Virtually all of the above facilities have excess capacity, especially if operations are shifted to cafeteria-style service. Even if the kitchen and serving area were operating at capacity during normal hours, they could be operated additional hours to feed more people.

### On-Site Inspection of Facilities

A visit to each facility to be included in the host area crisis relocation plan for the housing and feeding of relocatees is almost essential if the resulting plan is to be reasonable and workable. To permit the planning team some flexibility in considering the use of congregate care facilities, structures ostensibly containing about 120 percent of the required capacity will have been nominated for visit if the suggested procedures have been followed. The planning team can schedule the on-site inspections as they see fit. A suggested procedure is to put those facilities that look most promising on the basis of location, size, and use category high on the list, with the idea of not visiting the last group if the required capacity has been validated earlier. Since the inspections will require at least several days and more likely a week or two, the team should plan to compare notes at the end of each day and develop a running count of verified facilities and space.

The planning team should consider spending the first inspection day together to develop a common understanding of the ground rules to be used. Otherwise, differing standards may be applied by the various team members. In the host area survey, congregate care capacity was calculated at 40 square feet per person.

Thus, it would be useful to include a local fire inspector and perhaps other local personnel in the inspection party, at least for the first day. A variety of use categories should be included in the initial schedule.

A "business-as-usual" approach to the evaluation of lodging and feeding capacity should be avoided. All team members and local participants should understand fully that crisis relocation would be a true emergency in which normal standards must be compromised. The emergency standard for toilet commodes, for example, is one per 50 persons. Facilities, such as hotels and motels, can be considered as available to relocatees housed in other buildings within a several-block radius. Where definite deficiencies are

noted, the number of portable toilets needed should be recorded as an alternative to reducing the housing capacity of the structure. Hotels, motels, office buildings, and similar occupancies should be rather simple to evaluate. What is needed is the number and average size of rooms, from which the number of persons per room and total in rooms can be estimated. Lobbies and other common areas must be included at 40 square feet per person. Halls should be used, leaving a minimum 30-inch aisle. Furniture should be considered movable, although much of it will prove usable for sleeping and sitting. Similarly, school classrooms should be fully utilized unless the desks are fixed, in which case the aisles can be used for sleeping. Fixtures and stock in shops should be considered to be removed or stacked in interior spaces.

Functional needs for certain premises during the relocation period will often need to be considered, but minimum requirements should govern. For example, banks may need to remain available, so lobbies, teller areas, and vaults may be excluded as housing space. But loan and other departments can be dispensed with so that most of the office space, especially on upper floors, can be counted for lodging relocatees. As another example, repair and service areas in automobile dealerships should be reserved for transportation support but showrooms and sales areas can be used for lodging. Obviously, both ingenuity and common sense are necessary on the part of the inspection personnel.

Every facility visited should be checked for the existence of kitchen facilities that could be used for mass feeding. Commercial eating establishments, schools, churches, fraternal halls, and large commercial or industrial establishments are among the most likely sources. Emergency capacity will be controlled either by the kitchen capacity or the seating capacity. Assuming simple meals consisting of entrée, vegetable, and dessert, the maximum number of meals that can be prepared per hour should be multiplied by five to estimate the kitchen capacity. Seating capacity, as augmented by additional furniture to the extent room permits, can be multiplied by 10 to estimate serving capacity. The lower of the two estimates should be used as an estimate of mass feeding capacity. These estimates assume a five-hour meal period, generally two meals per day. In some cases, the number of local staff or institutionalized persons dependent on the same facilities may need to be deducted, but it may be assumed that host area residents will not "eat out" during the relocation period.

As the on-site inspection progresses, the planning team should monitor the results each day. Rarely will it be found that a

facility is determined to be wholly unsuitable for congregate care use. More likely, the capacity of lodging relocatees may be somewhat reduced because of the considerations noted above. Occasionally, an increased capacity may be uncovered. If the general trend of the inspections is to markedly reduce capacity, the team should review its procedures and standards, as a discount of about 10 percent is about the norm. If the factors affecting capacity are unusually negative, the team will find itself forced to add facilities in less desirable use categories to the candidate list.

### Steps 3 - Comparison of Relocatees and R/C Resources

In this step the planning team will compare the anticipated number of relocatees with the total number of congregate care facilities that have reasonable access to fallout shelter and feeding facilities with appropriate capacity. Shortfalls in either fallout shelter or feeding capacity should be noted for consideration in Section 4 or for inclusion in the requirements statement discussed later in this section.

### Step 4 - Identification of Special Care Facilities

The planning team should identify those facilities which could be used by special groups of evacuees with special needs or problems. Examples of these facilities include jails, hospitals, nursing homes and facilities for handicapped or mentally disabled. The specific identification of these groups will be discussed in the following section.

### Step 5 - Developing the R/C Organization

Once all lodging and eating facilities have been selected for a city or an area, some means of organizing them into a manageable system must be arranged in order to be able to provide for reception and care of residents and relocatees. Also, a county will obviously have relocatees assigned to more than one of its cities or areas, so that at this point the planning team will be faced with many pieces of the county divided into sections, as previously shown in Figure 2-1. A method for combining these sections and organizing the County into Reception/Care Divisions, R/C Districts, and Lodging Sections is described in Reference 7.

The hierarchy of R/C areas and chain of command is illustrated below and in Figures 2-2 and 2-3:

- The County
  - R/C Divisions (numbered I, II, III, etc.)
    - R/C Districts (IA, IB, IIA, etc.)

Figure 2-2  
TYPICAL COUNTY RECEPTION/CARE AREAS

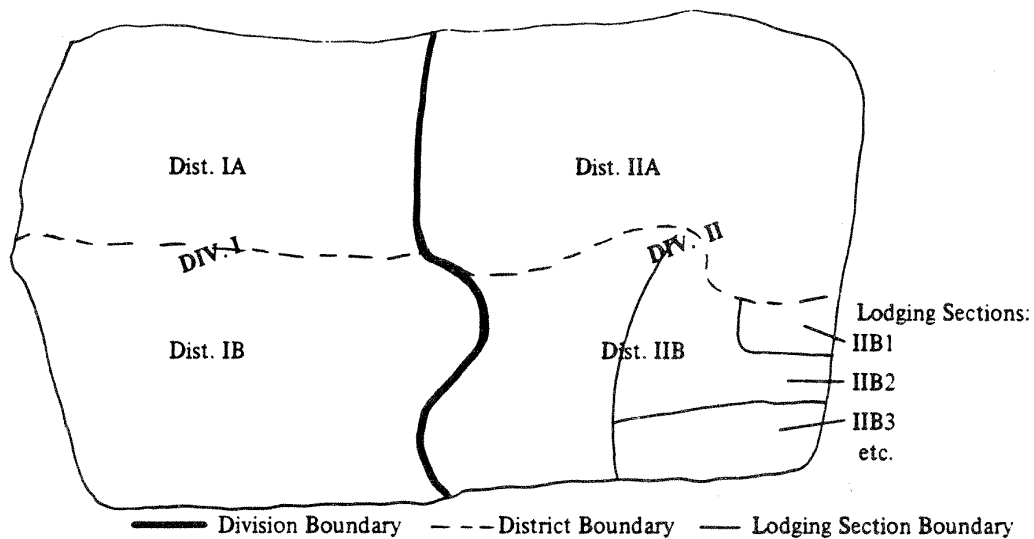
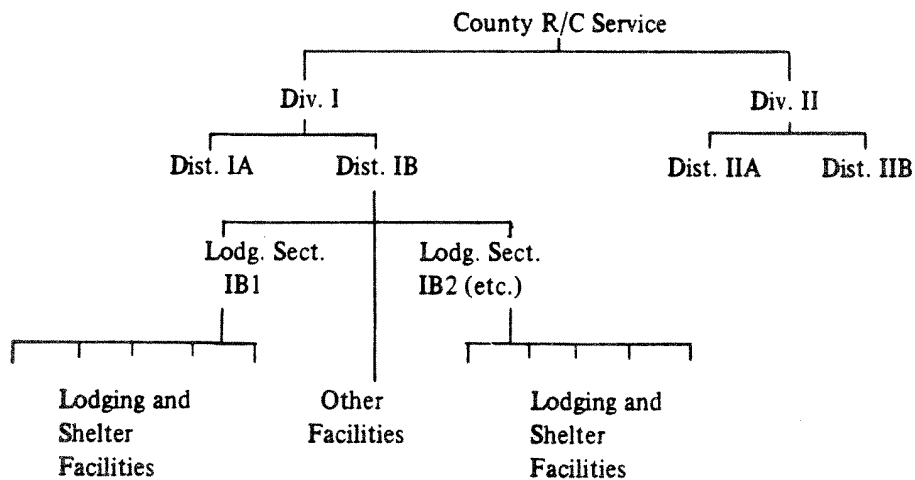


Figure 2-3  
RECEPTION/CARE CHAIN OF COMMAND



(Note that Lodging and Shelter Facilities are operated under control of Lodging Sections, whereas "other" facilities (Special Services, Feeding, etc.) are operated directly by the District.)



For any particular host county, the number of Divisions, Districts, and Lodging Sections will depend on such factors as:

- The total number of evacuees to be hosted.
- The ratio of the evacuees population to the resident (normal) population of the host County. Depending on the relative size of a region's risk and host areas, a host County's "quota" of evacuees might range from a very few people up to four or five times its normal population. The greater the need for numerous R/C headquarters and areas to break down the evacuee population into manageable units.
- The number of buildings to be used, the distance between them, and the extent to which evacuees can be lodged and sheltered and fed in the same buildings.
- The number of towns, or the concentrations of hosting facilities, in the County.
- Natural geographical barriers, existing political jurisdictions, and transportation networks which suggest logical divisions of the County into smaller units.

The following steps should be carried out with an eye to the factors just discussed. Local circumstances may dictate a modification of this approach to account for any of the factors previously described. The steps are only a general guide to the process.

- A. Group Districts into R/C Divisions. The Division is an administrative convenience which may or may not be required in a particular County. The small Division staff provides a link between the County Headquarters and numerous R/C Districts - where the number of Districts or geographical and transportation features make such an interim Headquarters useful. Normally, a Division should contain two or three R/C Districts; and Counties with no more than four Districts may want to ignore the the Divisional unit.
- B. Divide the County into R/C Districts. The District is the only unit below the County that will administer and staff all the Services included in Reception/Care (i.e., Lodging/Shelter, Feeding, Registration/Information, Special Services, and Personal Services). To the extent possible, each District should be a "self-contained" area having a number of

congregate lodging buildings, fallout shelter space in the District for all evacuees and all residents, feeding facilities, health facilities, special service-types of facilities like nursing homes, and buildings usable for personal services (such as pet pounds). It is desirable for a District to be built around a central "shopping area" - or, in many towns, several Districts may intersect at a central business district, with each reaching outward to include residential neighborhoods and a part of the surrounding countryside. As a very general rule of thumb, each District might be expected to contain about 10,000 people - including both evacuees and local residents, though this figure may vary widely.

- C. Divide District into Lodging Sections. The Lodging Section is managed by a Deputy to the District Supervisors for Lodging/Shelter, the only one of the five separate R/C Services which is divided into geographical units below the District level. (Lodging/Shelter controls all individual congregate lodging and fallout shelter buildings, whereas other Services would control only those facilities in the District which are required for their particular purposes.) Ideally, a Lodging Section would be "self-contained" in the same sense as the District, and focused on a central shopping area or public building, though this is seldom possible. A Lodging Section might contain from two to four thousand people - evacuees plus residents - and may vary in size from a single large congregate lodging building to many square miles in the rural portion of a R/C District.

#### Step 6 - Development of R/C Staffing Plan and Management Structure

This final planning step provides the organizational ability to carryout the R/C functions. Extensive additional material on this aspect of planning is contained in Reference 7.

The Reception/Care Service is organized in terms of three principal functions:

1. Welfare-Shelter Operations. These organizational elements are charged with managing the evacuee population throughout a crisis. Welfare-Shelter Operations would (1) provide lodging, feeding, and other essential services to the population in a lodging mode, (2) supervise the transfer of people from lodging into fallout shelter facilities, should the

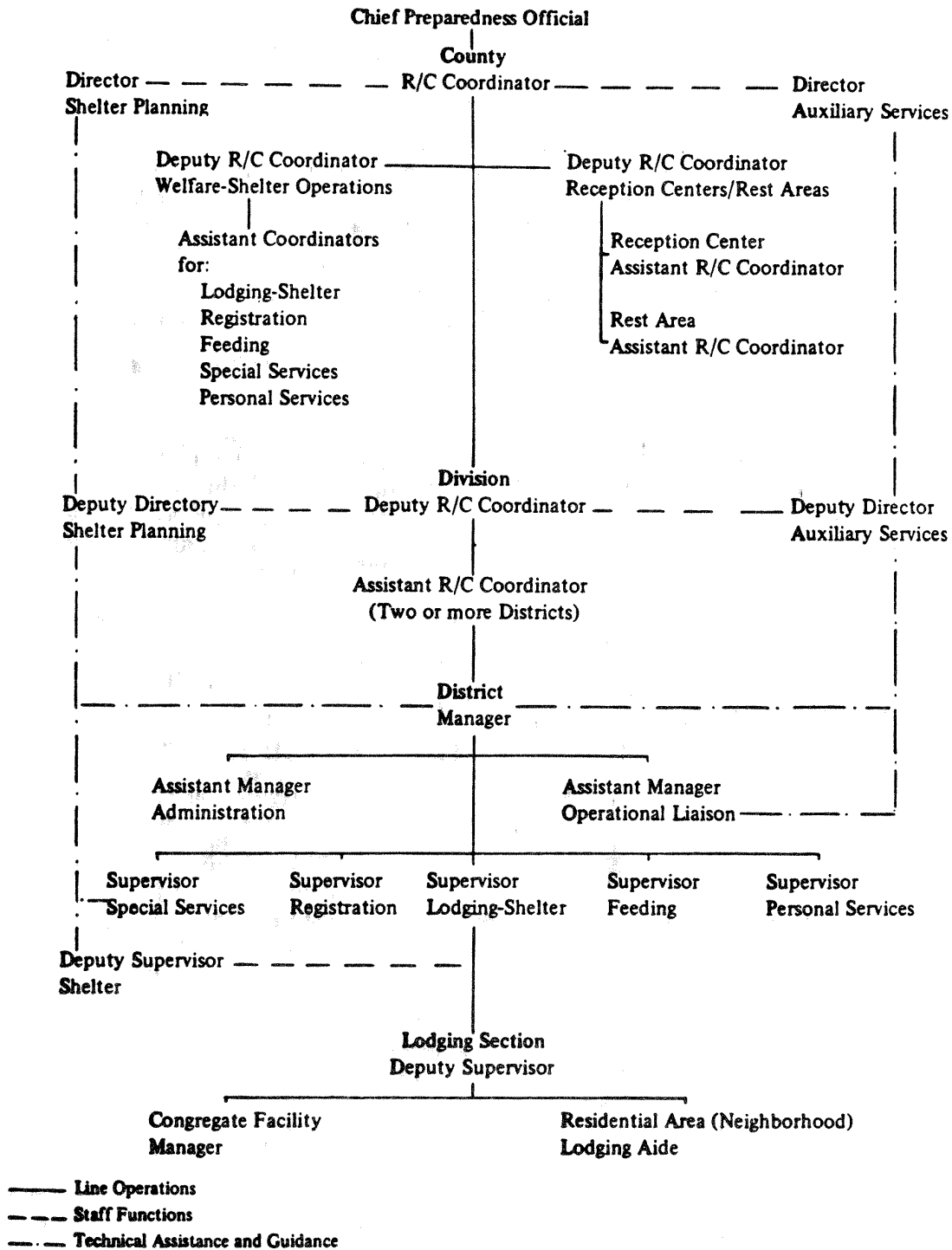
need arise, and (3) provide essential services to the in-shelter population. These elements would be in direct contact with the population to be served. Welfare-Shelter Operations is divided into five component Services.

- The Lodging-Shelter Service
  - Registration and Information Service
  - Feeding Service
  - Special Services
  - Personal Services/Clothing.
2. Shelter Planning and Allocation. Before and during a crisis, these organizational elements would plan the allocation of fallout shelter to local residents and evacuees, supervise the building or upgrading of fallout shelter, and advise Welfare-Shelter Operations personnel concerning the transfer of people into and out of a shelter mode.
  3. Auxiliary Services. These elements would provide public information to the population, plan and execute counseling and morale-building programs, and respond to needs for personal counseling during the crisis period. They, too, would advise and assist the Operations elements charged with managing people and services.

The chain of command to manage the R/C functions is outlined in Figure 2-4. In this simplified depiction it should be noted that:

- The five Services in Welfare-Shelter operations are responsible for managing the R/C effort and determine where the people are throughout the crisis.
- The Shelter Planning/Allocation and the Auxiliary Services elements are advisory and supporting elements, interacting mainly with the County and District commands and the Lodging-Shelter Service at the District and Lodging Section levels.
- Welfare Shelter Operations functions are fully elaborated and staffed only at the County and District levels. Divisions are treated as "intermediate" administrative units (and may not exist in some counties). Only selected Operations functions

Table 2-4  
RECEPTION/CARE ORGANIZATION



reach down to the Lodging Section and Neighborhood levels. Not shown here are other local facilities such as feeding units (operated by the Feeding Service) and special care facilities operated by Special Services.

### Staffing Concepts and Levels

It is not anticipated that the management structure described herein would be fully staffed - or even approach that level - during normal periods. The objective of R/C planning is to create an organizational "skeleton." During normal periods, designated core staff would maintain the plans and gradually recruit and orient additional core staff personnel. During a severe crisis, this core management group would rapidly be expanded to fill out the management structure described herein. Finally, during a relocation operation, additional management personnel, and large numbers of workers for their units, would be recruited from among the evacuee as well as residents populations.

The numbers of personnel required at the higher levels will vary with the number of R/C jurisdictions. For example, a county of 29,000-25,000 people, expecting to triple its population during a relocation, might be divided into approximately:

- 2 Divisions
- 6 Districts
- 16 Lodging Sections
- 1 Reception Center/Rest Area
- 1 Rest Area

The personnel required to staff such an R/C organization would be approximately 200-250, not counting managers of individual congregate care, feeding and special services facilities. However, at the completion of the plan development there might be only 40 or 50 core positions actually filled. The remaining positions would not be filled until the crisis buildup.

As a general rule, host county personnel should man Division and District staffs. At least one local person per shift at the Lodging Office is desirable. Other positions, such as Facility Managers, should be drawn from persons living or working in each of the congregate care facilities. The remaining core positions which cannot be filled by the host county, should be included in the Requirements Statement.

### Development of Registration Centers

In order to process evacuees properly, to assign lodgings, mass feeding location (if applicable), and inform them on the medical, sanitation, and movement rules, it is necessary to have evacuees report to a registration center on arrival in the host jurisdiction. Location(s) of the center(s) must be clearly posted on all access roads into the host jurisdiction.

It is advisable to use public buildings as registration centers, and the best ones are the schools. They generally are arranged to accommodate large numbers of people, their staffs are available, and their organization is readily adaptable to the task of processing the evacuees. In addition, these school buildings are usually located away from highly travelled roads; they have adequate parking space, and a transportation system exists within the school system. In some cases, the schools may have a dual-use as mass feeding installations when they are equipped with kitchens and lunchrooms.

It is suggested that planners consider using school personnel for Registration Centers. Others can also be used. The task assignments of the individuals working in the Registration Centers would be as follows:

- A. Administration (School Superintendent)  
Takes charge of assigned area for the following:
  - (1) Provides transportation from parking areas to lodgings via registration points. (School Transportation Administration).
  - (2) Activates a registration point in each assigned area. (Principals).
  - (3) Provides personnel to operate registration points and make lodging assignments. (Teachers)
  - (4) Provides a registrar to compile resource manpower information from registration cards. Figure 2-5. (School Business Administration)
  - (5) Assigns a Coordinator for each lodging in the assigned area. (Teacher)
  - (6) Assigns trained staff to supervise recreational activities. (School coaches, Physical Educational teachers, Junior Chamber of Commerce, Youth Directors, O.E.O. etc.)

- B. Registrar (School Business Administrator)  
Utilizes registration cards (Figure 2-5):
  - (1) To complete a list by occupation.
  - (2) To arrange an alphabetical file as a locator.
  - (3) To prepare lodging roster.
  - (4) To assign manpower as directed by EOC needs.
  
- C. Lodging Coordinator (Assigned Teacher)  
Is responsible for the following:
  - (1) Receiving assigned evacuees.
  - (2) Establishing a line of communication.
  - (3) Organizing lodging into a working unit.
  - (4) Determining requirements of food, sanitation, and other supplies for lodging and shelters and Support Services concerning distribution of supplies.
  - (5) Requesting aid as needed.
  - (6) Reporting problems or irregularities.
  - (7) Is authorized to use reasonable restraint against those who refuse to cooperate with the routine of shelter living under emergency conditions, and all other authority as specified in applicable local ordinances.
  - (8) Coordinates with fallout shelter Managers for movement after warning and compliance with Community Shelter Plan.

Operations Technique. A suggested evacuee processing system is:

- |                        |  |
|------------------------|--|
| 1st Stop-Registration: | Register individuals using the form shown as Figure 2-5: If mass feeding is anticipated, issue the tag shown as Figure 2-6. If mass feeding is not contemplated, a similar form may be used to assign the specific facility in which the evacuee will be housed. Enter the individual's name on the tag. |
|------------------------|--|

1. FAMILY NAME (PRINT)			12. EMERGENCY HOUSING ADDRESS-BUILDING			OR	
			NUMBER AND STREET			CITY STATE	
13. PRE-EMERGENCY ADDRESS			14. Social Security Number			15. PRESENT WHEREABOUTS (State where each person can be reached or write in the word "UNKNOWN")	
NUMBER AND STREET			CITY			STATE	
MEMBERS OF HOUSEHOLD WITH SAME FAMILY NAME (Fill out a separate card for each member of household with a differed family name)			10. SEX			11. AGE	
2. MAN			M				
3. WOMAN			F				
4. CHILDREN							
5.							
6.							
7.							
8.							
9. OTHER							
17. ADDITIONAL NAMES OR COMMENTS							
18. INFORMATION FURNISHED BY (NAME)			19. FILLED IN BY (NAME)			20. REGISTRATION PLACE	
						21. DATE	

Figure 2-5





2nd Stop-Lodging Assignment:	Assign lodging by family unit and enter the assignment on the tag (Figure 2-6). Enter the assignment on the Lodging Tally (Figure 2-7). If use of private transportation is provided, advise the evacuees of the pickup points.
3rd Stop-Feeding Assignments:	Assign a mass feeding facility within or close to the lodging. Enter the assignment on the tag (Figure 2-6). If the evacuee is to be lodged in private housing, either issue food stamps and assign a retail outlet or assign a mass feeding facility. (The specific method of feeding will be determined by the jurisdiction at a later date.)
4th Stop-Emergency Health:	Enter the location of the nearest facility on the tag (Figure 2-6).
5th Stop-Services:	Assign a laundry facility and clothing source. Enter the location on the tag (Figure 2-6).
6th Stop-Welfare Services:	Determine family needs and advise for securing the necessary social services. If there are Welfare needs, enter location on the tag (Figure 2-6).
7th Stop-Manpower:	Determine the skills of the individual from the registration card (Figure 2-5) or by other means. Keep a listing of these skills along with the name and lodging assignment so that these individuals may be located when the need for their skills arises. At that time, specific assignments may be made.
8th Stop-Transportation:	Issue bus schedule for local movement and then assign evacuees to a bus for transportation to their lodgings.

During the registration process, one of the individuals should be constantly checking the Lodging Tally (Figure 2-7) and entering information from this Tally onto the Lodging Assignment Log (Figure 2-8). In this manner, the registration center is able to maintain an orderly record of vacancies in the various lodging facilities and to assign incoming families without overcrowding a specific facility. It will also allow the registration center to know at a glance the status of their lodgings.

## REQUIREMENTS STATEMENT

Figure 2-9 shows the suggested form for stating requirements for reception and care. It is substantially typical of all of the Requirements Statements. Listing requirements for personnel, equipment, and supplies.

Two kinds of personnel may come from the risk area population: staff for the Lodging Offices and Floor Monitors for congregate care facilities. Supervisory personnel in the Lodging organization and one person per shift in the Lodging Office would preferably be local residents. Facility Managers should be drawn from persons living or working in each of the congregate care facilities. Skilled positions--chefs, cooks, etc.--in mass feeding facilities would be filled by those who normally work there.

Personnel for Lodging Office staffs should have skills appropriate for office work and would preferably have some experience in dealing with people. The number would be in proportion to the number of relocatees to be lodged. A suggested planning factor is five per shift where less than 750 persons are lodged and one additional person per shift for each 500 additional relocatees. Facility staff personnel--Floor Monitors--would preferably be suited to be Shelter Managers so that they could assume that position should it become necessary to occupy the shelters. One monitor per shift would be required for each floor except for large buildings in which the requirement should be one per hundred people on a floor.

In the suggested statement, requirements for personnel are identified by facility--lodging office and congregate care facility--and summarized for each lodging section. Lodging sections and congregate care facilities can be identified by name and address or facility number.

Equipment and supplies, if any required for management of Reception and Care activities can be listed by their commonly used names and the quantities stated.

Figure 2-7

### LODGING TALLY

Facility: \_\_\_\_\_ Number \_\_\_\_\_

Date \_\_\_\_\_ Registration Center at: \_\_\_\_\_

SPACES AVAILABLE: Rooms \_\_\_\_\_ Beds \_\_\_\_\_ 40 sq. ft.\* \_\_\_\_\_

No. Assigned	Time	Balance	Balance
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

\*Square footage may change due to lack of Congregate Care Space



HOST AREA REQUIREMENTS STATEMENT  
 \_\_\_\_\_COUNTY

A. Reception and Care

1. Personnel	_____		
	No. of People Required		
	_____		
<u>Lodging Section</u>	<u>Lodging Office Staff</u>	<u>Facility Staff</u>	<u>Total</u>
(Lodging Office)	XX		XX
(Facility No. and Name)		XX	XX
(Facility No. and Name)		XX	XX
_____			
(Section XXX)	XX	XX	XXX
(Lodging Office)	XX		XX
(Facility No. and Name)		XX	XX
(Facility No. and Name)		XX	XX
_____			
(Section YYY)	XX	XX	XXX
2. Equipment			
3. Supplies			

Figure 2-9 - RECEPTION AND CARE REQUIREMENTS

## RISK AREA

Reception and care is generally a function of host area planning, however, it must be recognized that a substantial number of people may remain in the risk area. These will include the workers employed in essential industries and operations, those people who cannot be moved for medical or other reasons, and those people who are unwilling to move. While it is not possible to determine in advance the total number of "stay-puts" they may account for as much as 20% of the risk area population.

### Planning for Stay-Puts

In the five-service concept of functional coordination, the management of and satisfying of human needs under emergency conditions is the responsibility of a Service. In the typical in-place protection plan, this service is usually called the Shelter Service, responsible for shelter leadership and operations although the personnel and organizations are expected to continue to provide people care after emergence from shelters. In the typical host area plan, the service is called the Reception and Care Service to emphasize the hosting aspect although the personnel involved are planned to staff the shelters, should the crisis culminate in a nuclear attack. In the risk area plan for crisis relocation, a similar combination of human care during the Relocation Period and shelter management during the Attack Period is contemplated.

Risk area support of this type will be centered primarily at the Staging Areas. The minimum support required during the Relocation Period is to provide a mid-shift meal to the essential work force. Food preparation should be centralized in a shopping center restaurant or school kitchen at the Staging Area. If, however, a large industrial facility in an operating area has more suitable food preparation facilities, arrangements may be made for meal preparation for the entire operating area. It should be planned to truck meals to the individual work sites from the central facility. The EOC and the resident facilities will have their own feeding capability. Outlying facilities and Access Control Points can be served from the most convenient Staging Area or from the nearby host area. An important aspect of this planning is to assure that risk area support and operations personnel on duty during the movement phase are provided some form of mid-shift meal on station.

Since normal sources of food and other necessities will be unavailable during the Relocation Period, there being no practical way to assure continued operation of supermarkets and the like, human needs support at the Staging Areas should anticipate serving stay-puts as well. The numbers of these individuals and families cannot be known in advance, but they could be substantial even in a very

intense crisis. The public information plan should include continued broadcasts to this group advising that help is available at the Staging Areas. However, the public information plan should not advertise in advance of the evacuation that provision is being made for stay-puts since this could be counter-productive to ensuring that the maximum number of people evacuate. Because it is highly desirable to relocate stay-puts to the host areas whenever they make themselves known, it is recommended that only meals be offered, not food supplies. Additionally, service agencies, and the American Red Cross as appropriate need to assign experienced counselors to each Staging Area for the purpose of providing sympathetic and responsive attention to the concerns of stay-puts that have inhibited them from relocating to a safer area.

Shelter and Care Service personnel at the Staging Areas will also be responsible for the internal organization and management of shelters in the event of use, the training of personnel at operating area facilities in shelter management and civil defense readiness, and for organizing tactical evacuation procedures where appropriate. Staffing of these functions by appropriate local government employees should receive the special attention of local civil defense coordinators.

#### Reception and Care Support to Host Area

Section A of the suggested format for a host county Requirements Statement concerns needs over and above host county capabilities for manpower, equipment, and supplies to aid in reception and care of the relocatees. Typically, the R/C need will be for personnel to staff the organization outlined earlier.

Risk area government employees not required for other emergency assignments are the preferred source or manpower for the residual reception and care requirement. Skill and experience in dealing with people problems is the most desirable attribute. Hence, local welfare and social services employees are most readily identified as appropriate to the assignment. The planning team should investigate the availability and numbers of persons involved with the appropriate local government officials. Generally, it will be found that the numbers of social service employees available is small compared to the reception and care requirement unless an unusually high proportion of the risk area population will be relocating as members of organizations. The largest pool of personnel who are generally effective in reception and care tasks, including shelter leadership, resides in the employees of the risk area school system, especially teachers and administrative staff.



### 3. MOVEMENT PLANNING

The orderly relocation of the risk area population to the designated host area is an important element of CRP. Planning for this movement involves determining the mode of transportation to be used, control of traffic flows, provision of fuel or emergency services, and provision of "public" transportation for those segments of the population without their own transportation. Without adequate planning many risk areas will incur unnecessary confusion and delay in the evacuation of their population.

#### MODE OF TRAVEL

The primary transportation resource for relocation and return will be the private automobile. The use of private autos will be the natural inclination of those that have them and in most risk areas is the only mode with adequate capacity to undertake the relocation within the time frame and to the destinations required for CRP. The use of private autos also enable people to take more goods with them to improve living conditions and to provide a measure of self-sufficiency in the host areas.

However, autos are not uniformly distributed among all segments of society and among all risk areas. The young, old, poor, handicapped, and many persons in densely populated areas with good local transit service are often carless. For example, in the City and County of San Francisco (Population 700,000) 40 percent of the households do not have automobiles available. However, in most communities under a million population 85 percent or more of the households have access to a private automobile.

The determination of auto availability by specific household or population category (as above) is a complex and difficult task; however, it is not intended that the CRP planner conduct a precise analysis of auto availability. Rather, general data on auto availability from BuCensus is adequate for CRP. The Census of Housing series, HC (1), (Reference 8), identifies the number of households with one, two, three or more, and no automobiles available. This data is available for SMSA's, Counties, and urban places as small as 2,500 population. The most appropriate level of aggregation (e.g., county or city) should be selected for the risk area being analyzed and the average auto availability figure should be used for the entire risk area. Care should be exercised so that the level of aggregation reflects as closely as possible the characteristic of the risk area.

## ANALYSIS OF MOVEMENT ROUTES

The initial statewide planning completed in the earlier phase of CRP identified the primary evacuation routes for each risk area and a preliminary evaluation of their capacity was conducted. At this stage of detailed planning this data may need to be refined.

In the initial traffic assignment done earlier in the statewide analysis, and average vehicle capacity figure of 1000 vehicles/lane/hour was used. This figure was a conservative generalization of capacity for all road and highway types. If this analysis indicated that highway capacity was not a problem and that evacuation could be accomplished within 24 or 36 hours no additional analysis should be required. If problems were apparent then the more detailed analysis described below is warranted.

Ideally the assistance of a state or local traffic engineer or transportation planner would be available for this section of the analysis. However, in case the professional assistance is not available, the following description of the analysis is provided.

The primary evacuation routes will generally be State or Federal highways. If these highways are four lanes or more and are limited access (no intersections or at grade crossings - all access by ramps and interchanges) they will have a theoretical capacity of 2,000 vehicles per lane per hour. A more realistic practical capacity for CRP purposes is 1,500 vehicles/lane/hour. If these multilane highways have at grade intersections, cross traffic can reduce their capacity to 1,000-1,200 vehicles/lane/hour.

If the highways are only 2 lanes (total lanes in both directions) then they have a theoretical total capacity of 2,000 vehicles per hour in both directions. With balanced flow, inbound and outbound, they could accommodate 1,000 vehicles per lane per hour. For CRP purposes, capacity of 2 lane highways should be considered as 850 vehicles outbound per hour.

Care must be exercised in applying these rates since they assume that the highway is uniform in cross section throughout its entire length and that it is constantly loaded. Often in metropolitan areas the highways in and near the city will be of multi-lane limited access design while in the rural areas they will reduce to two lanes or will have at grade intersections. When this is the case the lower capacity sections will control the total capacity of the roadway. The problem of continuous

loading is also important in movements scheduled over a number of days. The capacity figures discussed above are appropriate for short time periods only and it is doubtful that they could be maintained for 24 hours much less 72 hours. Therefore, when these capacities are used for movements extending for over 24 hours they should be reduced by 20 percent.

The following is a step by step description of the procedures for route analysis:

#### Route Analysis Steps

<u>Step</u>	<u>Description</u>								
1.	Determine the number of lanes or characteristics of the evacuation route. Where the number of lanes or operating characteristics are variable along a route, select the road segment that is most restricted.								
2.	Determine the practical capacity of the route by selecting the appropriate capacity figure below and multiply it by the number of outbound lanes:								
	<table> <tr> <th><u>Highway Type</u></th><th><u>Capacity per lane in vehicles per hour</u></th></tr> <tr> <td>Multilane Limited Access Highway (minimum of two lanes in each direction)</td><td>1,500</td></tr> <tr> <td>Multilane Highway without access control (at grade intersections)</td><td>1,200</td></tr> <tr> <td>Two Lane Highway</td><td>850</td></tr> </table>	<u>Highway Type</u>	<u>Capacity per lane in vehicles per hour</u>	Multilane Limited Access Highway (minimum of two lanes in each direction)	1,500	Multilane Highway without access control (at grade intersections)	1,200	Two Lane Highway	850
<u>Highway Type</u>	<u>Capacity per lane in vehicles per hour</u>								
Multilane Limited Access Highway (minimum of two lanes in each direction)	1,500								
Multilane Highway without access control (at grade intersections)	1,200								
Two Lane Highway	850								
3.	Determine the number of risk area persons who are assigned to the evacuation route.								
4.	Divide the risk area population (Step 3) by the average number of persons per dwelling unit to obtain the number of automobiles assigned to the route. It is not necessary to adjust this figure for those processes using public transportation to relocate, since this procedure is only an approximation and doesn't take into consideration the number of families using two cars to evacuate, or the impact of bus and trucks on highway capacity.								

5. Divide the number of autos (Step 4) by the route capacity determined in Step 2. If the resulting time to clear the risk area is more than 24 hours reduce the capacity in Step 2 by 20 % and complete Step 5 again using the new capacity figure.
6. Compare the clearance times obtained in Step 5 for each route and determine if there are major differences between routes. If major differences occur, additional effort should be directed at reducing the longer clearance times. This may be done by re-routing traffic to alternative routes leading to the same host area, by assigning traffic going to close in host areas to secondary roads instead of highways, by converting selected roads to one way operation, or by reassigning risk area population to other host areas.\*

## PUBLIC TRANSPORTATION

Transportation must be provided for those risk area persons without access to private automobiles for relocation. This will include households without private vehicles, transients in risk area without private auto, residents in group quarters or institutions such as nursing homes, and individuals whose automobiles breakdown during relocation.

### Demand for Public Transportation

The number of people who will require public transportation for relocation will be difficult to determine with precision.

### Dwelling Units Without Automobiles

The first category has been determined from the BuCensus publication Detailed Housing Characteristics appropriate to the risk area. Unfortunately this does not indicate the number of people in these autoless households. It is recommended that the average household size be used to estimate the number of persons in this category. In using these figures it should be kept in

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\*Conversion of two way highways to one way operation can be very hazardous and is discussed in more detail under movement control.

mind that they are approximations only, and it is not worthwhile to attempt to identify them on a census tract by census tract basis. Even though there may be concentrations of autoless households in a community the age of the census material and the overestimating of household size for this category precludes precision location of their incidences.

#### Transient Population

Similarly, this group of autoless persons is variable community by community and even by time of year. No accurate estimate of this population group can be made, therefore, providing adequate allowance for them in the public transportation plan must be left to the judgment of the planner.

#### Residents in Group Quarters

This category of autoless population can be estimated from BuCensus data on group quarters. However, this number should be used only in preliminary planning and as a control figure since specific identification of these group quarters and institutions is not warranted. Many persons in group quarters will be elderly or infirm and some form of door to door transportation will be required. Similarly in institutions such as orphanages, boarding schools, and detention facilities, special transportation arrangements will be required.

#### Stranded Motorists

Many people who are counted in the category of owning automobiles will not have an auto available because it is temporarily inoperative, a family member is away on a trip or it breaks down on the evacuation route.

It is estimated that under normal freeway operations there is an incident requiring motorists aid every 20,000 vehicle miles traveled. The incident may be an accident, equipment failure, or simply running out of gas. On an evacuation route 50 miles long, carrying 70,000 vehicles a minimum number of incidents would be 175. It is likely however, to be much higher than 175 since congestion increases the incident of mechanical failure and many of the vehicles in the evacuation will be in poor condition and not normally subjected to long trips.

Assuming that 200 vehicles are disabled that would strand 500 or 600 persons depending upon the vehicle occupancy. If they are not picked up by other passing motorists it would require approximately 15 buses to accommodate them.

The remaining persons in this category are even more difficult to estimate. Therefore, it is necessary to include some additional public transportation capacity for these persons even though their precise number is unknown. More importantly the operational plan for providing public transportation should be responsive and flexible enough to accommodate them during the relocation phase when their numbers become known.

### Resources for Public Transportation

The resources for public transportation include private automobiles not being used for relocation, automobiles in dealers inventories or owned by private industry and government, numerous categories of buses, trucks, trains, and airplanes. Each of the resources is analyzed below:

#### Multiple Car Families

Approximately 40 percent of families in the nation have two or more private vehicles. Some of these vehicles, approximately 6 percent in California, are owned by households with 5 or more persons and they will probably be used by them in the evacuation. The major problem in using the remainder for the autoless population is the issue of their private ownership and the detailed planning necessary to insure their assignment to another household.

#### Fleet Cars

Commercially and government-owned automobiles are approximately 5 to 10 percent of the total registered automobile inventory. Another fraction of a percent is located in new and used automobile dealer inventories. These vehicles have the same availability and assignment problems mentioned above.

#### Buses

The bus inventory is made up of school buses, intracity transit buses, charter and tour buses, and intercity scheduled buses. Buses in general are the most prevalent and flexible form of mass transportation available in the nation. They can be easily routed and scheduled and in carrying capacity they typically

carry 8 times as many persons as autos per lane of highway.\*

Table 3-1 indicates the ownership/use categories for the bus inventory in California. While the inventory will vary from area to area the percentage distribution among categories is considered representative. School buses account for 60 percent of the inventory and intracity bus an additional 26 percent. Charter and intercity buses account for only 15 percent and their availability is questionable since they serve numerous geographical areas.

### Trucks

Commercial trucks account for less than 10 percent of vehicle registrations. Approximately one-half of the truck fleet is unsuited to carrying people since they are special purpose vehicles used in manufacturing, construction, forestry, mining, etc. The remaining inventory could be used for transporting people, however, they would provide only marginal capabilities since they are not equipped with seats, ventilation, loading steps, etc. They also have the problems of being under diverse ownership and are wide ranging geographically similar to charter and intercity buses. Appendix E contains supplementary information on the use of large vehicles in evacuating carless persons from high risk areas.

### Trains

In general, trains will have only a small role in the movement of people during relocation. There were only 7,500 passenger cars in operation in 1971\*\* in the entire nation. Since many of these cars serve more than one risk area their availability to a specific community in a crisis would be questionable. However, where intercity commute service is currently in operations trains may be available for crisis relocation.

Use of freight cars for movement of people has similar problems in amenities as those discussed under trucks. Trains have an additional problem in terms of their inflexibility. They must be boarded at a station which presents access problems to the autoless person. They have limited routes of travel which may or may not coincide with the host area destinations of relocatees.

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\*Actually capacity is 2 or 3 times autos in CRP since in normal highway operations automobiles seldom average more than 2 occupants.

\*\*Summary of National Transportation Statistics, U.S. Department of Transportation, November 1973.

Table 3-1

## INVENTORY OF BUSES IN CALIFORNIA

Population Areas	Local School Bus	Intracity Transit Bus	Charter Bus	Intercity Scheduled Bus	Total Buses
San Francisco Conglomerate	3,632	2,576	504	420	7,132
Los Angeles Conglomerate	5,423	2,946	882	735	9,986
San Diego Conglomerate	1,150	437	144	120	1,851
Individual Target Counties	2,335	256	162	135	2,888
Total: All Risk Counties	12,540	6,215	1,692	1,410	21,857
Non-Target Counties	2,060	26	108	90	2,284
Total: California	14,600	6,241	1,800	1,500	24,141

SOURCES: School Bus -- State-assisted school transportation statistics adjusted according to population to include non-assisted transportation.

Intracity Transit Bus -- California County Fact Book, 1976-1977; County Supervisors Association of California.

Chartered and Intercity Bus -- California Transportation Plan, Volume I (Draft); 1975, CALTRANS: State totals apportioned to areas according to population.



### Airplanes

Private aircraft are similar to private automobiles in their limited carrying capacity and their preemption by their owners in terms of their suitability and availability for carrying autoless individuals out of the risk area. Scheduled air transportation resources are an attractive complement to auto evacuation, however under terms of their licenses, all scheduled aircraft are subject to priority use by the Federal government during a national emergency.

### Conclusion

Trains, where available, and buses in all areas are the only major transportation resources available for moving autoless persons. In order to plan for their utilization, an inventory of the resources must be conducted. The area to be inventoried should include the entire conglomerate - both risk and host areas. Contact should be made with local railroad company offices and bus operators, both transit properties and school districts.

Information should be obtained on the number and capacity of each vehicle. In calculating the capacity of vehicles it should be kept in mind that the vehicles will have to carry both people and personal belongings. Also, the capacity of school buses is normally given in number of school children carried which is substantially larger than the number of adults and personal effects that they can haul. For example, Type I school buses are normally rated to carry 54 or 66 passengers. For CRP purposes they probably cannot carry more than 40 adult passengers.

### Public Transportation Operations

All of the public transportation resources used in evacuation should be under the control of a single agency for crises relocation operations. While the vehicles should continue to be operated by their normal owners or operators the scheduling of the emergency assignments should be coordinated by a single public agency knowledgeable in transit operations.

Since door-to-door service will be limited to institutions or group quarters with special problems the normal pick up point for autoless persons should be the neighborhood elementary school. These schools are generally well distributed throughout the risk area and their location is well known. The school also can provide facilities for temporarily accommodating families or persons

aviating transportation. Local school staff should be assigned the responsibility of operating the transportation terminals set up at each school. They would register incoming individuals, notify the transportation operation's center of the number of relocatees needing transportation, provide access to school facilities as needed, and provide current information to the relocatees regarding anticipated schedules for departure.

The transportation planning team should meet with the transportation operators to work out the details of the movement plan. An early concern will be how to assure that drivers will report to operate the vehicles. In the case of buses, should the family go with the driver on the bus. Can arrangements be made for backup drivers on the same or on a similar basis? Additionally, the numbers of people expected at each school, the number of buses expected to be available, and the numbers of people to be delivered to each host county need to be matched to devise a bus schedule.

An initial estimate of bus passengers can be made by proportioning the total estimated number of persons in households without autos to the percentage of school children in each school. If the number of bus passengers is large at any one school it may be desirable to attempt to schedule the number of persons reporting to the school each day. This could be done by alphabet (use last initials obtained by dividing the telephone book into equal groups of pages) or by using combinations of street addresses or telephone numbers.

Stranded motorists along the evacuation routes will provide a special problem for public transportation. It is impossible to determine in advance the number and location of stranded motorists. If possible stranded motorists should be assigned to low occupancy vehicles by local traffic control personnel. If that is not possible then separate bus runs will be required to provide this transportation.

## DESIGNATING REST AND STAGING AREAS

Once a basic movement plan has been agreed upon, it is possible to designate rest areas for relocatees. A rest area is a suitable facility where occupants of vehicles can obtain water, comfort facilities, medical aid, and information relating to routes, destinations, vehicle maintenance, and fuel. Rest areas commonly found at 20-30 mile intervals on Interstate and other major highways perform a similar function and may be the choice if they are properly located and if parking areas can be expanded into adjacent fields. (The staffing of the rest areas is not the responsibility of the Sheriff or State Police except for traffic and crowd control

and prevention of crime. Other requirements are dealt with in later sections.)

After the main movement of relocatees into and through the county has been completed, it should be planned to convert one or more of the rest areas near the entry points into the county into staging areas where trucks with supplies and equipment can check in, obtain instructions or directions for delivery, and, if necessary, park trailers as temporary warehouses. These staging areas generally will become major operating basis for much of the relocation period activities; hence, they should be chosen with some care.

## MOVEMENT CONTROL

Control of vehicle movement may be necessary to assure orderly access to and smooth traffic flow on outbound routes. Movement control can be exercised in both a positive and negative manner. Positive control would be exercised by specifically directing each vehicle to a specific route and destination, as by a policeman observing some identifying mark or questioning drivers at an intersection before allowing access onto a particular outbound route. An example of negative control would be to block off a street with barricades, which would then limit the choice of routes available to the motorist.

The planning team should recognize that a movement control system in the form of traffic signs, traffic signals, and uniformed officers already exists in every risk area. The population is familiar with this system. To the greatest extent possible, this system should be left intact so as to minimize the special information or surprises required by or awaiting the traveler. Where special control is necessary, negative or passive control, such as barricades, is to be preferred in order to reduce manpower requirements.

If cross-streets are to be barricaded, they should be closed at least one block from the arterial so that motorists have a turn in the outbound direction that will bring them to an access point. Crossing relocation routes at grade separations is preferred.

If the street and highway layout in a portion of the risk area is of such character that periodic interruption of traffic flow for commuting cross-traffic will not allow capacity flow on the outbound route or routes, a special study is recommended of the dimensions of commuting traffic, based on the risk area operations planning of Section 9. Indirect commuting routes, halting of the relocation flow for 10 minutes or so at certain

times of the day, and similar measures should be evaluated in this study.

In certain instances consideration has been given to using the wrong side of a freeway in order to double its capacity for evacuation from the risk area. There are several factors including the need for an extensive control system that should be considered in evaluating this option.

The initiation of wrong-way flow generally requires elaborate preparation and a high degree of coordination if it is maintained for a significant distance. Sequential phasing would have to be developed so that upstream on-ramps were closed and traffic on the freeway directed off at certain points. This ramp closure and freeway clearing would involve physical control to guarantee success. One car proceeding in the direction opposite to the outward flow could completely block the freeway by causing one major head-on accident.

Only after the freeway had been completely cleared could the wrong-way flow be initiated. Traffic control devices or a uniformed officer would be required to initiate the wrong way flow. Upon arrival at the approximate destination it would be necessary to exit the freeway using either an on-ramp or an off-ramp. The geometric design of off-ramps make it particularly awkward to exit from the wrong way direction. Use of on-ramps for exiting places the motorist on local streets heading in the wrong direction.

The final problem is the need for two way traffic for official vehicles and priority traffic to enter and sometimes pass through the risk area. This could be very serious in terms of Defense Department traffic who may have to reach strategic facilities on location during the movement phase.

Since movement control is an operational function of the Law Enforcement Service, the basic planning should involve the host and county Sheriff's Office, local police departments and, usually, the State Police or Highway Patrol. Liaison should be established with these agencies and participation encouraged. Planning options should be presented to the Sheriffs and the county executives for review and decision at appropriate points.

### Planning for Breakdowns

Plans should be made for handling vehicles (autos or buses) with mechanical problems, flat tires, out-of-gas, and the like, especially during the initial movement phase. Since normal two-way traffic will be maintained on all highways, access by

tow-trucks from "downstream" maintenance facilities and gas stations will be relatively straightforward. Observation of the traffic flow for breakdowns or accidents by helicopter is a desirable arrangement if these are available. Additionally, circulation of police vehicles over sections of the route will assure that a car passes by a particular point at regular and frequent intervals. Typically, the State Police cover the freeways and major through routes while the local forces are responsible for the secondary roads and streets in the county. Much depends, however, on the forces available and special arrangements may be necessary to define the roles of the State, county, and city law enforcement agencies in the crisis relocation plan. All service stations and repair facilities along the movement routes should be incorporated into the planning and those not on the designated routes should be considered as alternate sources of fuel and maintenance. Some of these may be sources of maintenance vehicles and mechanics to be stationed at the rest areas.

#### Planning Vehicle Parking

The arrival of assigned relocatees will usually triple or quadruple the normal number of vehicles in the host county. Much congregate care space is concentrated in the business districts of the communities in the host county. Street parking or off-street parking facilities are unlikely to be sufficient to accommodate relocatee vehicles. Thus, vehicle parks are likely to be necessary, at least in parts of the host county.

The matter of parking automobiles arriving in the host areas is closely tied to the policies that will govern use of these vehicles during the relocation period. The number of vehicles involved, if used freely, would overload the county roads and city streets. Gasoline may be in short supply. Hence, minimal use of private transportation would be indicated. One solution that has been suggested is to impound the vehicles bumper-to-bumper in fields or other suitable areas near the edge of the communities of the county and to bus the relocatees from the impoundment parks to their relocation headquarters or to a reception center. This solution offers a number of problems. Relocatees will have been advised to bring food and other supplies and equipment with them. This will make the movement from impoundment park to lodging facility quite difficult. Many relocatees will likely bring additional supplies and valuables and wish occasional access to the vehicle, which serves as a place of safekeeping. Some relocatees will require the use of a vehicle in performing their duties in the host county or in the risk area.

Many relocatees will bring pets, which can be housed in the vehicle if they can be visited daily for feeding and exercise. Finally, for people housed in crowded congregate quarters, the vehicle may offer a place of privacy and quiet that will make austere accommodations endurable, if not pleasant. Moreover, equity demands that whatever is decided about use of vehicles be applied equally to host county residents as well as the relocatees. Indeed, there is no practical way to enforce grossly disparate standards.

An alternative procedure is to leave the relocatees vehicles in the possession of their owners but available for authorized use only. If families are taken into volunteered dwellings, they should take their cars with them. If housed in congregate care facilities, the vehicle parks should be within reasonable walking distance; say, not more than a mile and a half from the place of lodging. Movement control is maintained by insisting on trip passes for both residents and relocatees. More-or-less permanent windshield markers can be issued to those who must drive to work. Others must obtain a temporary pass similar to those issued to visitors at military bases and industrial facilities at the lodging Section Office. As discussed in Section 3, these Lodging Sections include not only the congregate care facilities but also the adjacent residential areas.

Whether vehicle parks are of the impoundment type or of the more normal type, they must be provided with 24-hour guard service. If the trip pass method of movement control is adopted, one duty of the custodian should be to check outgoing and incoming vehicles for possession of a proper pass.

One reasonable procedure for facilitating reception and care upon arrival is to arrange temporary short-term parking in the vicinity of relocation headquarters, reception centers, and lodging facilities so that possessions can be delivered to lodgings, after which the vehicle driver is directed to a vehicle park within walking distance. The planning team should spell out these arrangements, Lodging Section by Lodging Section, throughout the county, as special circumstances are likely to exist in each. The numbers of peace officers, vehicle guards, and traffic monitors needed to expedite the reception of relocatees and control movement thereafter should be estimated for each Lodging Section and entered on a tally sheet.

### Camps and Trailer Parks

Many of the relocating families from the risk area are likely to relocate in recreational vehicles, tow a house trailer or tent trailer, or at the least, bring camping gear. While the number

that will do so is uncertain, host county planning should include identification of existing sites suitable for the purpose and designation of additional sites if a probable need is established. These sites should be specified in advance so that recreational vehicles and trailers can be directed to them during the initial movement and so that other services can be planned to include them. In general, use of recreational vehicles should be encouraged, as it would ease the problem of housing the relocatees. It is likely, in any event, that owners of such vehicles and equipment would attempt to bring them in order to be more self-reliant.

### Host County Transportation

Once the relocation operation is essentially complete, movement control will center on minimizing vehicle utilization by residents or relocatees in commuting to essential jobs in the county (or non-essential jobs, if continued operation is feasible and permitted), to shop at markets and commercial establishments, and the like. It may be desirable for the planning team to review whether establishing or augmenting local public transportation should be considered in the host county crisis relocation plan to serve the needs of residents, relocatees, or both. In this respect, it should be recalled that, although congregate care facilities are planned for all relocatees, many and, perhaps, most are likely to be taken into volunteered dwellings in the vicinity of their congregate lodgings. Any plans for in-county public transportation routes must be sufficiently flexible to adapt to these locational uncertainties. Once routes are selected and pickup points selected, layouts for maps and associated information should be included in the emergency public information materials discussed in Section 10.

### Control of Movement to the Risk Area

Unless the host county is so located that relocated employees of essential risk area facilities are housed there, traffic toward the risk area should be confined to trucks and trains engaged in the transportation of essential supplies to the host county and counties beyond and other essential traffic. Checkpoints should be planned for near the county boundaries on the main highway routes, using weighing stations, rest areas, ports of entry, or other facilities. All traffic should be required to stop at the checkpoint before proceeding.

If commuting of workers is involved, the commuting is likely to be by rail, bus, or private vehicles. The use of trains, buses, or trucks will ease considerably the control of unauthorized movement. When private vehicles are used (carpool or otherwise)

the basic identification procedure will be based on possession of an identification card with picture from a government agency or business concern, the name of which appears on an approved list at the checkpoint.

Host counties will be advised by the State at least 12 hours prior to an order to allow the return of relocatees to their homes in the risk area. The State will specify the order in which the host counties will be permitted to release controls on movement to the risk area. Generally, the nearest counties will be cleared first before movement from more distant counties is initiated. The period of return is likely to extend longer than the initial movement outward. Refueling of relocate vehicles will be a major concern of planning. Otherwise, the arrangements for movement to the main routes, monitoring of traffic, operation of rest areas, and handling of breakdowns and accidents will be similar to those required for the initial movement. Since multiple access onto main transit routes is preferred in the return movement, a separate route plan and map for the return should be made part of the host county crisis relocation plan.

#### Concluding Actions

The planning team should document the results of planning for the movement of people to the point where review and concurrence can be obtained from local risk and host areas authorities. The movement plan should be summarized, with supporting maps, for later inclusion in the risk and host area operational plan (Section 9) and as input to the planning for movement of supplies and equipment (Section 8), and preparing public information materials (Section 10).



#### 4. PROTECTION FROM WEAPON EFFECTS

One of the most important elements of CRP is the protection of the population from the effects of nuclear weapons if an attack should be carried out on the United States. The attack environment will be substantially different for risk and host areas in that the major hazard in the risk area will be the combined effects of blast overpressure and residual fallout while the host area is assumed to be subject to residual fallout only.\*

This section describes the planning steps recommended to provide for adequate fallout shelter for both local host area residents, and relocatees, the development of host area requirements statements, and the provision of all-effects shelter for those persons remaining in or commuting to the risk area.

Since a thorough knowledge of weapons effects is a prerequisite to planning for either blast or fallout shelter the planning team should become thoroughly familiar with the DCPA Attack Environment Manual, Reference 9, prior to undertaking this element of planning.

##### HOST AREA FALLOUT SHELTER

On the basis of the risk analysis conducted by DCPA, typical fallout levels have been estimated for each of the host areas. These estimates apply only to the assumed attack and average weather conditions and in the case of an actual attack the fallout levels will vary substantially from those calculated. There is, therefore, no absolute criteria for determining the minimum or maximum level of protection that should be provided. In developing the CRP plan the planner will depend upon his own judgment, the existing shelter inventory, and the availability of resources for upgrading existing buildings or providing expedient shelter.

The general rule in planning for fallout protection is to use the best (highest protection factor) shelter possible. Ideally, the fallout shelter should provide enough protection to reduce the dose received to an equivalent residual dose of 50R. The equivalent residual dose is the effective dose to infinity received after allowing for the biological recovery which takes place over time.

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\*An underlying assumption in CRP is that host areas will not be subject to direct weapons effects in the event an attack should occur. Isolated instances of weapon detonations (from misdirected or malfunctioning weapons) may occur in or near host areas but these cannot be predicted in a manner that would allow the CRP planner to develop specific protection criteria.

The ERD is roughly equivalent to the dose received during the first four days of exposure. An ERD of 50R or less will normally not result in any reasonable physiological damage or radiation exposure symptoms. Based upon the "typical" attack used in the risk analysis studies, virtually 100% of the population of host areas would survive in PF100 shelters. However, even at a PF20 approximately three quarters of the population would receive a dose of less than 250R. The key point is that everyone is provided with fallout protection and the better the protection the greater the chance for survival and the less severe the symptoms of radiation exposure. Therefore all shelters should be upgraded to the maximum extent possible.

## SOURCES OF FALLOUT PROTECTION

The sources of fallout protection in the host area are: 1) inherent shelter identified in existing buildings during host area surveys; 2) residential home basements; 3) space in existing buildings that is upgradable (also identified in host area surveys); and 4) expedient shelters constructed during the crisis period. Each of these categories of shelter are discussed below:

### Identified Fallout Shelter

The inherent shelter in existing structures is the most available and easiest to use in that the location and PF category of the shelter is known from the host area surveys. There are two sources of data for host area shelters--the CRP Host Area Shelter Survey printout and the NSS printout. Both printouts are of value since they contain different elements of information. Tables 4-1 and 4-2 are sample pages from the 1978 printouts for Placer County, California. Appendix C provides an interpretation of the abbreviations and codes used in these printouts.

In most cases facilities with fallout shelter space will also contain congregate care space. Because of the different planning factors used in defining these spaces--40 square feet for congregate care and 10 square feet for fallout shelter--many facilities have more shelter capacity than congregate care capacities. For example, a one story building with a basement may have two to four times as much shelter capacity as congregate care space. If each floor were 4000 square feet it could have 100 to 200 congregate care spaces depending upon the suitability of the basement for congregate care. The 4000 square feet in the basement could provide up to 400 fallout shelter space.

PLACER	CRP HOST AREA FACILITY LISTING AS OF SEPT 30, 1978	PAGE 26938
MCD-PLACE-BSAC- SLA 72RA 0001		
SL-FAC BUILDING NAME	NUMBER R STREET NAME	D I
00220 PLACER COUNTY HOSPITAL AUBURN	370 ELEN STREET CROSS STREET-- RAVINE ROAD	
00223 PLACER COUNTY JAIL AUBURN	219 MAPLE ST CROSS STREET-- WHITE ST	
00224 PLACER COUNTY COURT HS AUBURN	CROSS STREET-- MAPLE ST CROSS STREET-- WHITE ST	
00225 PACIFIC TEL BUS OFFICE AUBURN	948 LINCOLN CROSS STREET-- ALMOND ST	
00226 PLACER HIGH SCHOOL AUBURN	163 AGARD CROSS STREET-- ROLLINS CT	
00227 PLACER HIGH ADM OFFICE AUBURN	275 ORANGE CROSS STREET-- ROLLINS CT	
00228 PLACER HIGH AUBURN	163 AGARD ST CROSS STREET-- HIGH ST	
00229 PLACER HS S MING AUBURN	163 AGARD ST CROSS STREET-- HIGH ST	
00230 BERNHARD MINERY AUBURN	SACRAMENTO AND HIGH CROSS STREET-- PLEASANT AVE	
00231 PLACER SAVING AND LOAN AUBURN	949 LINCOLN MAY CROSS STREET-- HIGH STREET	
00232 JC PENNY CO AUBURN	908 LINCOLN MY CROSS STREET-- HIGH ST	
00235 PACIFIC GAS & ELECTRIC AUBURN	1050 HIGH ST CROSS STREET-- E PLACER ST	
06027 TELEPHONE EXCHANGE AUBURN	1125 LINCOLN MAY CROSS STREET-- OAKWOOD DRIVE	
06028 TANDEM TITLE COMPANY AUBURN	1283 LINCOLN MAY CROSS STREET-- COLLEGE MAY	
06029 ST JOSEPH SCHL AUBURN	1162 LINCOLN MY CROSS STREET-- ST MAY W9	
06287 PLACER CNTY HEALTH AUBURN	55 ELMWATER AVE CROSS STREET-- STATE HWY W9	

TABLE 4-2

NSS ALL FACILITY LISTING AS OF SEPT 30, 1978																	PAGE 15026	
FALLOUT SHELTER SPACES																		
BLAST SHELTER CODE AND SPACES																		
DESCRIP CODE																		
CRP SPACES																		
C D FLOOR E 1-3 E BSMT																		
TOTAL BSMT																		
PF CAT 1																		
PF CAT 2-3																		
PF CAT 4+																		
CONG. CARE																		
I O U R S M S E F N E DATE																		
FAC NO.																		
BLDG NUMBER																		
D I R STREET NAME																		
CITY																		
PF CAT 0																		
159																		
GEORGET																		
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85																		
0																		
4																		
79																		
0676																		
MCD																		
PLACE																		
RSAC 72R4																		
SLA 0003																		
01844 TAC-A-LAC LODGE																		
01865 PT + T BLDG																		
01866 TAHOE SAVINGS + LOAN																		
07028 TAHOE NATIONAL BANK																		
07036 TAHOE NATIONAL BANK																		
07077 BARTON MEMORIAL HOSP																		
07121 McDONALDS																		
07350 ERIHAN MANSION																		
07354 VIKINGSHOLM																		
07383 S LAKE TAHOE AIRPORT																		
MCD																		
PLACE																		
RSAC 72R4																		
SLA 0004																		
00001 EL DORADO CORTHE ANNEX																		
00002 ELDORADO COURT HOUSE																		
00004 RAFFLES HOTEL																		
00005 MASONIC TEMPLE																		
07418 SECURITY PACIFIC BNK																		
07503 EL DORADO SAVINGS																		
07506 SANITEX CLEANERS																		
07510 SEC PACIFIC NAT BANK																		
07552 BANK OF AMERICA																		
07568 PLACERVILLE FRUIT GRMR																		
07569 EL DORADO UNION HIGH S																		
07570 SECURITY PACIFIC																		
07571 POST OFFICE																		
MCD																		
PLACE																		
RSAC 72R4																		
SLA 0005																		
01038 CHILE BAR NINE PLACER																		
07417 ART BLDG ELDRD UNION H																		
07531 WELLS FARGO BANK																		
VILL																		
CA																		
LIMORHIA																		
550																		
CANAL ST																		
186																		
PLACERVILLE DR																		
PLACERV																		
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A major concern with basement shelters or many upgraded shelters is that airflow must be maintained in order to control the "effective temperature"\* in the shelter. At effective temperatures over 82° the environment becomes increasingly uncomfortable and will cause substantial cardiovascular stress. Above 90° effective temperature human beings have only limited tolerance and circulatory collapse is likely.

As would be expected the severity of the effective temperature problem increases in the Southern and Eastern Climates due to the high temperature and humidity conditions during summer months. Therefore in those areas with effective temperature problems it will be necessary to either reduce the shelter capacity by increasing the square feet allotted from 10 square feet to a higher number or to provide additional air flow. DCPA has developed a number of ventilation kit designs, for use in the above applications, however, only a small procurement of these kits was made and they are generally not currently available. Appendix E contains a design of an air pump that can be constructed quite easily with readily available material.

Technical assistance is available from DCPA to assess the effective temperature problem with either basement or upgraded shelters and to develop solutions thereto.

### Residential Basements

Approximately 50% of the homes in the United States have basements. Unfortunately, as shown in Figure 4-1, the percentage of homes with basements is quite variable in different regions of the country. Detailed results of home basements surveys may be available in the State civil preparedness office.

If the host county has an effective fallout shelter plan for its residents, this information may already be available in the county CSP. As a rule of thumb, about 8 percent of residential basements will offer a protection factor of 40 in basement corners.

The remainder will have 20PF but can be upgraded to 40PF by means similar to those discussed later for the larger facilities. At the shelter-space standard of 10 square feet of usable space per person, the average home basement could hold 100 people or more. A more reasonable planning factor is 20 to 30 people or 5 to 8 families. Thus, wherever the percentage of homes with basements

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\*Effective temperature is a measure that combines the effect of air temperature, air moisture, and air movement to yield equal sensations of warmth or cold and approximately equal amounts of heat strain.

## PERCENTAGE OF HOMES WITH BASEMENTS

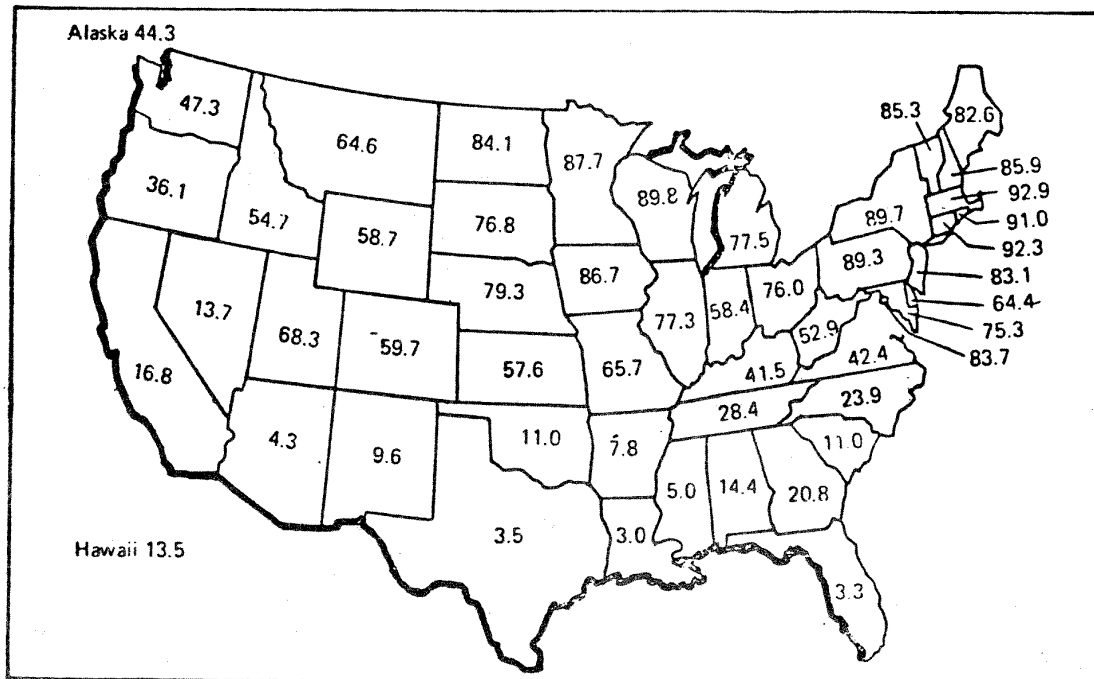


Figure 4-1

exceeds 15 to 20 percent, it is practical to consider the sheltering of at least the residential population by the sharing of home basements.

There is an extensive body of research indicating that a high percentage of residents of homes with basements will be willing to share their basement with others. For example, in a recent field test in the Colorado Springs host counties, 82 percent of the households with suitable basements indicated they planned to use and share them in nuclear crises. About half of these residents indicated they would share with other local residents and half indicated that they planned to share with both local and relocated families. It seems reasonable, therefore, to plan to request the voluntary sharing of basements and to assume that a very large proportion will cooperate. In many States, a minimum sheltering assumption should be that host county residents will be sheltered in residential basements and that congregate shelters will be used by the relocatees. In each host county, however, the Region/State planning team should consider the prevalence of residential basements and estimate the residential need for community shelters. In some States of the South and the Southwest, this need will amount to the total population of residents and relocatees. In many northern States, it can be assumed that both residents and the relocated families taken into volunteered dwellings can be accommodated in residential basements. This is a reasonable planning basis in Colorado, for example.

#### Upgradable Shelter Space

It will often be the case that the existing fallout shelter space will not accommodate all who need shelter, despite the fact that the Host Area Survey has identified a great deal more shelter in non-metropolitan areas than previously was thought to exist. In the fallout shelter surveys of the 1960's, survey activities were concentrated on the urbanized areas. The survey usually did not extend more than 25 miles from population centers. Hence, the Host Area Survey has increased significantly the shelter inventory in the host counties. Nonetheless, except where residential basements abound, shelter deficits are likely after crisis relocation has occurred. In this circumstance, the planning team should next consider shelter space potentially available through upgrading of parts of the congregate care facilities. This emphasis is appropriate because engineering studies and full-scale experiments have demonstrated that less effort is required to improve the shielding characteristics of existing structures than to construct new shelter by digging and covering trenches, for example.

Information on upgrading shelter space is contained on the CRP Host Areas All Facility Listing. A sample page of this printout is shown on Table 4-1 and an explanation of the coding is

contained in Appendix C. The column headed "UPGRD" indicates if the facility is upgradable and whether the basement and/or first floor is the upgradable portion. The next column, "RESON," indicates the reason the facility is not upgradable. The "DIST" column indicates the distance to a source of soil for upgrading. The last two columns indicate the number of upgradable spaces in the facility and the cubic yards of soil necessary for upgrading. These upgradable spaces are in addition to any existing NSS space listed in the column headed "NSS PF 2+ SPACE."

Appendix D contains illustrative examples of upgradable congregate care facilities and residences. Additional advice on shelter upgrading is available from the DCPA Regions.

### Expedient Shelter

In some instances the requirements for shelter space may not be met by use of the resources identified above. Should that be the case the CRP planner will have to develop plans for constructing expedient shelter in the host area. These shelters would not be constructed until crisis relocation became imminent.

Expedient shelter can be broadly classified as "above ground" or "below ground." Examples of typical expedient shelter designs are contained in Appendix F.

There is no hard and fast rule on the preferred type of expedient shelter to be included in CRP's. Both above and below ground shelter types can be constructed to provide PF's of 250-500. Where suitable construction equipment--trenching machines, backhoes and frontend loaders--the below ground shelter also has a slight advantage over the above ground shelter in that they offer some protection from radiation even where they are not completely finished. Figure 4-2 shows the protection factors possible with open or lightly covered trenches.

The expedient shelter designs shown in Appendix F have been tested by the Oak Ridge National Laboratory and Colorado University to determine if they could be constructed by typical families using readily available tools and materials. The results of these tests indicate that most families could construct these shelters in the daylight hours of a single day. While these designs are illustrative of a variety of techniques that could be used in varying locations and conditions there are numerous variations of these or other designs that may be suitable for each specific location. None of the designs shown are particularly suited to very cold winter conditions that preclude earthmoving. Additional research is underway to develop winter expedient shelter designs for the northern climates.



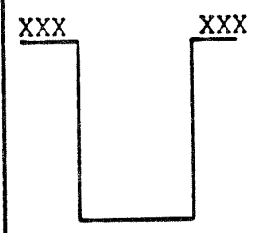
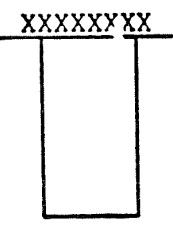
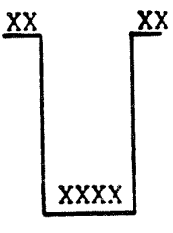
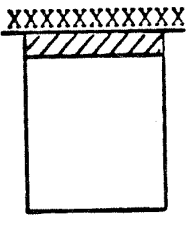
	A. Decontami- nation Transparent Cover	B. Trans- parent Cover	C. No Cover	D. Dense Material Cover (50 psf)
				
Protect- ion Factor	33	9	6	26

Figure 4-2

PROTECTION FACTORS POSSIBLE WITH TRENCH SHELTERS

In addition to the construction of the shelter it is also essential that provision be made for water storage in the shelter along with food supplies. It may also be necessary to provide for mechanical ventilation in the below ground shelters if the host area is likely to cause effective temperatures of 82° or more. These shelters will be imminently more livable with light since most of the designs will result in total darkness inside. Appendix F also provides instruction on the construction of an air ventilation pump and an emergency lamp.

### Planning Steps

The steps necessary to plan for fallout protection for host area residents and relocatees are shown in the flow chart in Figure 4-3.

As in the case in most of the CRP planning elements, the actual number of planning steps depends upon the local conditions. Where there is adequate existing shelter space in congregate care facilities the planner need only follow the steps outlined on the left of the flow chart. Where there are serious shelter deficiencies it may be necessary to follow all of the planning steps outlined.

Each of the steps are described below:

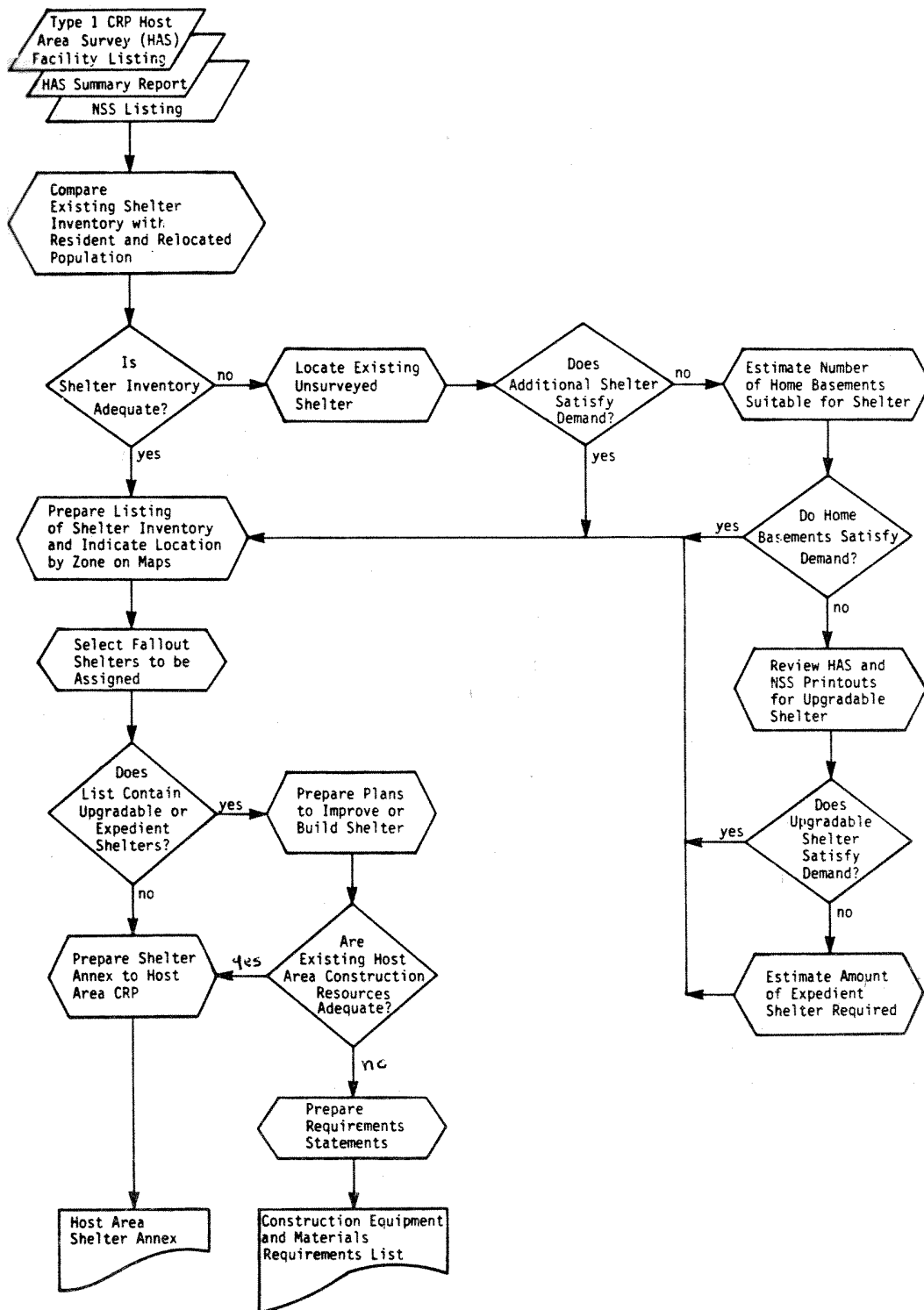
1. Compare Shelter Inventory with Demand - In this step the CRP planner should use the host area survey Summary Report to determine the total number of existing shelter spaces in congregate care facilities. This should be compared with the total of the resident population and the relocated population assigned to the host area. If the shelter inventory has enough spaces to accommodate the total population then the planner should proceed to list and select the shelter facilities that will be used.

If the existing inventory does not contain sufficient shelter space then the planner must identify additional shelter space as noted below.

- 2a. Locate Existing Unsurveyed Shelter - Depending upon when the Host Area Survey (HAS) was done, there may be new facilities constructed since the survey which would have shelter space. Also in some areas the HAS was limited in scope and did not completely survey the host area if space appeared to be available for all relocatees.

Figure 4-3

## FLOW CHART OF SHELTER PLANNING STEPS



Data on new facilities can be obtained from city and county building departments. Another category of facility which may have been outside the original boundary of the survey are mines, caves, and tunnels. Information on these types of facilities is often available from local geologists, the State Department of Geology, or from local universities or colleges with geology departments.

- 2b. Home Basement Shelters - If additional shelter space is still required an important resource will be residences with basements. A typical home basement will have a PF of 20 and with upgrading it can often be increased to 40. The two primary sources of data on home basements are BuCensus and home basement surveys conducted by DCPA.

BuCensus "Detailed Housing Characteristics" Series HC (1) B contains information on the number of homes with basement for SMSA's and places of 10,000 inhabitants or more. This data can be used directly, where applicable, and to estimate the amount of homes with basements in rural areas of less than 10,000 inhabitants.

If data is available from the DCPA home basement surveys it would be located in the State Civil Preparedness Office. Specific location of home basements and the specific assignment of families to them may be a difficult task. A recent report from the University of Pittsburgh discusses the use of home basements and suggests methods for collecting inventory data.\* A windshield survey is probably the most cost-effective technique to use. However, due to the labor costs for such a survey, existing employees such as police or fire personnel would have to be used. If they are available, volunteers may be required.

In terms of theoretical capacity the average home basement can accommodate approximately 100 persons. A more reasonable planning factor is 20 to 30 persons or 5 to 8 families. The most likely assignment for these home basements is local families in the neighborhood rather than relocatees.\*\*

- 2c. Upgradable Congregate Care Space - If a shelter deficit still exists then upgradable space should be included in the inventory. As mentioned earlier, this information can be obtained from the Host Area Survey printouts. Initially, only summary data is needed to determine the magnitude of this resource.

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\* Jiri Nehnevaja, Home Basement Sharing: An Analysis and a Possible Approach to Planning, University of Pittsburgh, University Center for Urban Research, September 1976.

\*\* NCP planners should encourage host area resident (through EPI materials) to share their basement space with others. Home basement sharing is to be accomplished on a VOLUNTARY BASIS ONLY and planners SHOULD NOT specifically allocate such space to evacuees from risk areas.

- 2d. Expedient Shelter - The last category of shelter space is not subject to inventory since they are to be constructed during the crisis period. This step is merely concerned with identifying the anticipated shelter deficit and determining the number of shelter spaces that must be constructed.
3. Prepare Shelter Listing - This step includes the preparation of lists of specific shelter facilities located by street address. The list should be aggregated by zone to facilitate the shelter selection and assignment tasks. In addition the zones should be identified on a map and the inventory shown by category (surveyed, home basement, etc.) along with resident and relocated population.
4. Select Fallout Shelters to be Assigned - It should be noted at this point that fallout shelters do not need to be close by the homes and facilities in which residents and relocatees live. It is, of course, preferable if they are within a half-hour to an hour walk for the people assigned, but this is not an absolute requirement. If an attack should occur, the time when fallout could arrive in the host county will generally be several hours after it is known that detonations have occurred. Time is available to transport people to the good shelters. A plan would have to be made to do this, of course. The planning team should review Chapter 6 of the DCPA Attack Environment Manual to gain an understanding of the time available in the host county for movement to fallout shelter. Then, the location of high-capacity fallout shelter space should be compared with the location of the population to determine the feasibility of use. If a transportation plan is required, it should be developed as a part of the Resource and Supply Service Annex to the host county crisis relocation plan. (See Sections 7 and 9).
5. Prepare Plan for Upgrade or Building Shelter - If the shelters selected for assignment include upgradable or expedient shelter, then additional planning is required to assure their availability. If a qualified shelter analyst is not a member of the Region/State planning team, the services of such an individual should be requested from the State or DCPA Region to review the proposed sheltering plan and to evaluate any questionable facilities. The upgrading requirements should be reviewed with the host county engineer or highway agency to establish the equipment and manpower required to accomplish the upgrading over a three-day period. If construction of expedient shelters is also required, requirements for materials, equipment, and manpower should be developed based on data in references 10 and 11 and a review of the specific locations where such shelters are needed or where they can be built.

Public parks and other open spaces may be the most suitable for this purpose. Logistical requirements for shelter upgrading and construction should be compared with capabilities available within the host county. Shortfalls should be identified for inclusion in the Requirements Statement for us in allocation of risk area resources.

6. Prepare Requirements Statements - Figure 4-4 shows the suggested form for stating requirements for construction support. For the most part, construction support would be required for shelter upgrading and expedient shelter construction. The requirements, then, depend on the projected needs for shelter work by type. Shelter upgrading consists largely of earth moving: to and around building walls, into buildings onto the floors or onto the roofs, and it may or may not involve the filling of "sand bags." On the other hand, expedient shelter may consist of a trenching operation followed by the placing of some kind of a wood cover and thereafter the moving of earth onto the wood cover.

Requirements for construction support in the form of earth moving, whether for shelter upgrading or construction of expedient shelter, are best stated in terms of organizational capability. This avoids the difficulties that would ensue should the host area planners attempt to specify equipment, operators, and supervisors with no certain knowledge of what might be available. It is preferable for the planners to estimate how much earth would need to be moved--dug, hauled, and placed for upgrading and expedient shelter cover and trenched for expedient shelter. Then, assuming 3 days to be allowed to complete the shelter work, the quantity estimates can be reduced to yards/day requirements for organizational capability. For this, organizational capability is taken to include equipment, operators, helpers, supervisors--everything except unskilled labor and such normally available supplies as fuel.

Depending on the design to be used, expedient shelter may require skilled labor--chiefly in the woodworking trades--not normally employed by earthmoving contractors. Or it may be that the earthmoving capabilities in the host area might be increased if additional equipment operators were available. Any such requirements for skilled construction personnel should be identified by skill, number, and location.

Unless a surplus of equipment operators exists in the host area, there should be no requirement for construction equipment apart from that to be brought by construction organizations. But if a requirement can be foreseen, it should be stated--in terms of type, quantity, and location.

## HOST AREA REQUIREMENTS STATEMENT

\_\_\_\_\_ COUNTY

## Construction

## 1. Organization and Capacity

<u>Location</u>	<u>Capacity Required</u>	
	<u>Earth Moving</u>	<u>Trenching</u>
	yd3/day	yd3/day
(place)	xxxx	xxx
(place)	xxx	

## 2. Personnel

<u>Location</u>	<u>No. of People Required</u>		
	<u>(skill)</u>	<u>(skill)</u>	<u>(skill)</u>
(place)	xx		xx
(place)	xx	xx	

## 3. Equipment

## 4. Supplies

FIGURE 4-4 - CONSTRUCTION SUPPORT REQUIREMENTS

Not stating a requirement does not mean that construction equipment other than that held by construction organizations may not be moved to the host area. Risk area planners may wish to move surplus equipment from the risk area as spares to replace breakdown or simply for its own protection.

Shelter construction will require hand tools possibly in excess of the supplies available in the host area. The need for these tools would be pressing; there would be no time to wait until the normal supply channels brought them in. Therefore, any such requirement for tools should be stated. The EPI material should also stress the need for bringing hand tools from the risk area and sharing them in the host area.

Bags for "sand bags" are convenient for shelter upgrading especially when it involves placing earth on floors. They are necessary for some types of expedient shelter that involve building of walls. Again, these would be needed soon after the relocation started and any requirement for them should be stated. Some types of expedient shelter require sawn lumber, others use doors or poles. The availability of these materials should be a consideration in selecting the types of expedient shelter to be built. However, if a requirement for sawn timber can be foreseen, it should be stated. Both upgrading and expedient shelter require nails and spikes and polyethylene sheeting or its equivalent.

Shelters of all kinds pose serious requirements for internal water supply and sewage disposal. Many shelters in the risk areas have been stocked with water drums and sanitation kits. These items will be needed in host area shelters and requirements for them should be stated in terms of quantities and locations.

7. Prepare Shelter Annex to Host CRP - This step is the synthesis of the previous steps into the actual operations plan for providing shelter. It will follow the general format outlined in Section 10. In addition to the standard five part format of the body of the annex, there should be separate appendices that contain a checklist of actions, procedures for upgrading and expedient construction (as necessary), and a shelter inventory list. The stocking of shelters should also be included here and be reflected in the other annex's such as food.



The actual assignment of population groups to shelter facilities must also be contained in the plan. It may be included as an appendix to the shelter annex, however, it probably belongs in the reception and care annex since the actual assignment will be done either at the time of registration or at a later time in the congregate care facilities by the reception and care staff.

## RISK AREA SHELTER

The protection of key workers and other residents of the risk area is an essential element of the risk area Crisis Relocation Plan. The need for protection of the key worker is beyond dispute, however, there has been substantial controversy in the field regarding the amount of planning that should be done for stay-puts. The following rationale is provided for the planning for this latter group.

From a Philosophical view, all citizens, even those who do not follow official instructions, have an inherent right to be protected from the effects of a disaster--whether nuclear or natural. Furthermore from a totally pragmatic view, by not providing for the protection and well being of the stay-puts they may well compete with the key workers for shelter and other resources in a disruptive fashion.

### Level of Blast and Fallout Protection Required

DCPA has conducted a risk analysis of potential target areas in the United States and on the basis of an assumed attack has calculated the blast overpressures and fallout levels for each of the risk areas. This data is available from DCPA on a 2 minute grid base.

Figure 4-5 illustrates the blast contours for 15 psi and 2psi overpressures and that portion of the grid base for the Wichita, Kansas risk area. Table 4-3 indicates the weapons, height of burst, yield, and latitude and longitude of each weapon that impacts Wichita. It is noted that the nine 20 megaton weapons listed are ground bursts at hard military targets in the area all of which contribute fallout radiation to the risk area. The remaining three 1 megaton weapons are directed at soft military or countervalue targets in or near Wichita. They are air bursts and are the cause for the overpressures indicated in Figure 4-5. Table 4-3 also indicates for each cell in the grid base its location, blast overpressure, and 4-day radiation exposure (R) in an unprotected posture.

# WICHITA, KANSAS

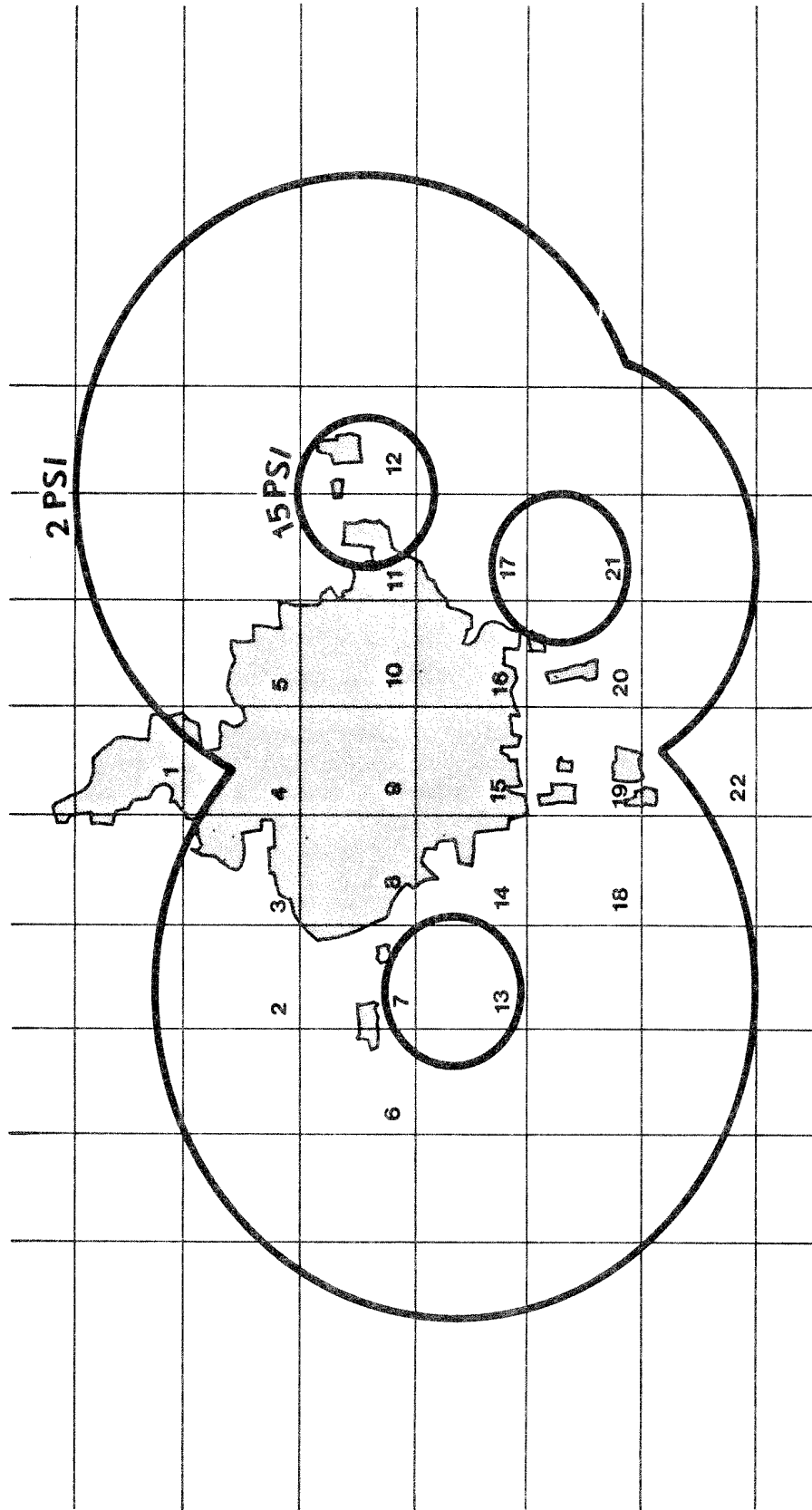


Figure 4-5  
Illustrative Example of Grid Base  
and Blast Contours

Table 4-3

## Attack Threat - Wichita, Kansas

<u>Weapon</u>	<u>HOB (M)</u>	<u>Yield (MT)</u>	<u>Lat (DEG)</u>	<u>Long (DEG)</u>
1	0	20	373400	964600
2	0	20	373900	963900
3	0	20	371700	971300
4	0	20	371100	972400
5	0	20	374500	974500
6	0	20	374100	980400
7	0	20	372500	980400
8	0	20	372400	970000
9	0	20	374100	965000
10	2256	1	373700	971500
11	2256	1	374110	971316
12	2256	1	373907	972552

<u>Unit Area</u>	<u>Lat (DEG)</u>	<u>Long (DEG)</u>	<u>Overpressure (PSI)</u>	<u>4-Day Dose (R) (unprotected)</u>
1*	374615	972015	1.5	19700
2	374345	972515	3.2	21700
3*	374345	972245	2.7	22600
4*	374345	972015	2.1	23600
5	374345	971745	3.6	24700
6	374115	972745	8.5	23500
7	374115	972515	10.6	24500
8	374115	972245	5.9	25600
9*	374115	972015	2.9	26900
10	374115	971745	5.1	28200
11	374115	971515	13.5	29600
12	374115	971245	29.6	31100
13	373845	972515	26.3	26700
14	373845	972245	9.0	27900
15	373845	972015	3.5	29200
16	373845	971745	7.6	30600
17	373845	971515	12.4	32100
18	373615	972245	4.6	29400
19*	373615	972015	3.8	30700
20	373615	971745	10.3	32000
21	373615	971515	23.4	33500
22*	373345	972015	2.6	31500

\*Host areas for relocatees

### Blast Protection

The following table indicates the percentage of cells that fall within the various overpressure ranges.

<u>Overpressure at Cell Centroid (psi)</u>	<u>Percent of Blast Risk Cells</u>
20 or greater	14
10-19	18
5-9	23
2-4	41
0-1	5

It can be seen from the table that 69% of the blast risk cells in the illustration experience less than 10 psi overpressure.

In this example shelters with blast resistance in excess of 30 psi would protect everyone outside of 1.4 miles of ground zero. It is obviously not possible to know in advance if an attack will occur, where the ground zero(s) will be, the size of the weapon(s), and other attack parameters necessary to design a protective strategy. It is possible however to generalize that 50 psi shelters would probably protect over 90% of the population in the risk area from the blast hazard regardless of the location of the ground zero provided there were not more than 3 or 4 one megaton weapons in the attack on Wichita. If only 10 psi shelters were available, then probably 30 to 50% of the population remaining in the risk area would be killed by blast overpressure.

### Fallout Protection

As was discussed earlier under host area fallout shelter planning, it is desirable to limit the 4-day radiation dose to less than 50R. In the illustrative example (Wichita) the assumed 4-day fallout doses varied from 19.700R to 33.500R. These fallout levels would require shelters with protection factors of between 400 and 700. The upper boundaries for 4-day dose are between 200R and 250R which will cause casualties for 50% of the people so exposed. This upper boundary criteria if applied to the Wichita example would reduce the shelter Pf requirements to between 80 and 140.

### SOURCE OF ALL-EFFECTS SHELTER

The source of all-effects protection in the risk area are: 1) inherent shelter identified in the National Shelter Survey (NSS); 2) upgradable existing buildings; and 3) expedient shelter construction.

### NSS All-Effects Shelter

The NSS identifies space in existing buildings that have inherent radiation and/or blast protection characteristics. Where appropriate the NSS listings identify both the Pf category (0 to 1 and 2+) and the general type of blast resistance inherent in the buildings construction. Table 4-4, describes the blast codes used and the corresponding rating in terms of median lethal overpressure (MLOP), median casualty overpressure (MCOP), and typically accompanying PF. The table also indicates the relative percentage distribution of these shelter types in the national inventory.

Assuming that no more than 20 percent of the normal risk area population will be in the risk area after relocation, the percent distribution of shelter types shown on Table 4-4, indicates that all of the stay-puts and key workers generally could be sheltered in type A, B, or C shelters. This would provide a PF in excess of 500 and MLOP/MCOP of at least 10/7 psi.

### Upgraded Shelter in Existing Buildings

The NSS printouts do not currently list upgradable space in risk areas, however, research is underway to provide information on upgrading techniques and the potential yields from such upgrading activities. Preliminary results from completed research studies indicate that upgrading for fallout protection will produce the same yields as have been found in the Host Area Surveys. Upgrading for blast resistance may produce an increase of two or three fold in the MLOP/MCOPs for basement structures having 3 or 4 psi inherent blast resistance.

### Expedient Shelter Construction

Expedient shelter construction provides excellent opportunities to develop all-effects shelter. The shelter designs contained in Appendix F will provide fallout protection of at least 200 PF (with the exception of the covered hole which is 80-100PF), and the below ground configurations have been successfully tested at 5 to 55 psi. The most blast resistant design is the small pole shelter in a fully underground configuration. The log over the trench design was successfully tested at 13 psi.

As was stated earlier in this section all of the designs in Appendix E have been built in the field by a cross section of the general public and they can be built by the occupants in a maximum of 120 man hours. In the most recent round of tests (22 shelters built by individual families) all shelters were completed in less than 12 hours elapsed time.

Table 4-4

## Inherent Protection of NSS Structures

<u>MLOP/ MCOP (PF)</u>	<u>Shelter Type</u>	<u>Percent Distribution</u>	<u>Description</u>
35/25 (1,000-10,000)	A	10%	Subway stations, tunnels, mines, and caves with large volume relatives to entrances.
12/7 (100-1,000)	B	21%	Basements and sub-basements of massive (monumental) masonry buildings.
9/7 (100-1,000)	C		Basements and sub-basements of large, fully engineered structures having any floor system over the basement other than wood, concrete flat plate, or band beam support.
8/4 (10-50)	D	0%	Basements of wood frame and brick veneer structures including residences.
9/2 (20-80)	E	27%	First three stories of buildings with "strong" walls, less than ten aboveground stories, and less than 50% apertures.
6/2 (20-100)	F		Fourth through ninth stories of buildings with "strong" walls, less than ten aboveground stories, and less than 50% apertures.
5/2 (100-200)	G	42%	Basements and sub-basements of buildings with a flat plate or band beam supported floor system over the basement.
5/2 (20-80)	H		First three stories of buildings with "strong" walls, less than ten aboveground stories, and greater than 50% apertures; or first three stories of buildings with "weak" and less than ten aboveground stories.
4/2 (20-100)	I		All aboveground stories of buildings having ten or more stories. Fourth through ninth stories of buildings having "weak" walls.

Note: For the above description, load bearing walls are considered as "weak" walls.

### Location of Risk Area Shelters

The location of risk area shelters is considerably more critical than the location of host area shelters. In the former case only minutes may be available to reach shelter while in the latter case the arrival of fallout will probably not occur for an hour or even 5 or 10 hours in some cases.

The location of the risk shelter to ground zero is also extremely critical since the blast overpressure varies quite widely with even small differences of distance from the detonation. For example, in the Wichita illustration example key workers seeking best available shelter in their immediate vicinity would suffer 52% fatalities--evenly divided between blast and radiation causes. However, if they took best available shelter in the lower risk areas of the city, the fatalities drop to 31%--virtually all from radiation. If instead of using best available shelter they used expedient shelters of 15 psi/500 PF in the lower risk portions of the city, the fatalities approach zero.

Recognizing the uncertainty in identifying the higher and lower risk sections of a target area, it would still seem to be prudent to locate construction sites for expedient shelter in areas removed from the city center, heavy industrial complexes, and potential military targets. The sites selected should be within a ten minute travel time from the key workers employment location.

## 5. PLANNING MEDICAL SUPPORT

This section discusses the medical services planning required for the host area, the form and procedures for requesting medical support from the risk area, and the risk area medical support planning required.

### HOST AREA PLANNING

The medical support element of the host county crisis relocation plan deserves careful consideration at an early stage of the planning process. The influx of large numbers of relocatees and their lodging in structures not intended for living in, possible conditions of crowding, limited sanitation facilities, and possible contamination of mass feeding utensils make an increase in the incidence of many diseases very likely. Moreover, there is evidence from a variety of disaster experience that many people dependent on medication for well-being, if not life, fail to bring these medications with them. Relocation is very likely to separate the family from their physician and normal avenues of health care. At the same time, most host counties are deficient in health care resources. Many counties do not have a health department and quite a few do not contain a hospital. Preparedness to deal with medical problems in the crisis relocation context probably depends on conscientious planning to transfer the medical capabilities of the risk area to the host counties along with the relocated population. Since health care delivery for the most part lies in private hands, planning for this transfer is a real challenge.

Host county medical support involves three distinct areas of planning: (1) medical support for the "moving population" during the relocation and return periods, (2) care for the current patient load, the chronically ill, and the aged, and (3) health services for the "normal" population, both relocatees and residents. These aspects will be discussed in the order named although the major problem stressed will be the last discussed. The prospective head of the Health and Medical Service in the host county relocation plan, who probably heads the county health office, if such exists, should be asked to participate or audit the planning effort. Participation by the County Medical Association and the local chapter of the American Red Cross should also be solicited.

#### Support of the Movement Phase

Mobile medical aid at the scene of vehicular accidents and other emergencies is normally the responsibility of either private ambulance companies or the Fire and Rescue Service, although law



enforcement agencies are responsible in some counties. The planning team should adopt the customary policy of the host county in this respect. The responsible local government unit should be apprised of the crisis relocation movement plan and the prospective traffic volumes. A plan should be developed indicating where rescue vehicles and ambulances should be stationed to provide adequate coverage of the main transit route(s) and the designated county relocate feeder routes. Capabilities within the county to provide medical aid personnel, vehicles, and equipment should be summarized and compared with the plan requirements. Shortfalls should be recorded for inclusion in the Requirements Statement discussed later in this section. These requirements will be considered for the relocation of such resources in the risk area. Additional discussion of Mobile-Medical Aid is contained in the Public Safety Section (6).

Emergency room capabilities in the host county must also be identified and related to the ambulance locations. In addition, at least two local physicians (per shift) for the three-day movement period should be stationed at the transit rest areas (and, if practical, the relocate rest area) to tend to medical complaints among the enroute population. These arrangements will become a part of the Health and Medical Service Annex.

Comparable plans should be made for the return phase of the Relocation Period.

#### Planning Continued Medical Care

At any particular time, some portion of the risk area population, estimated at about one percent on the average, are receiving medical care as patients, residents, or inmates of hospitals, homes, mental institutions, and other institutions of specialized care. A considerably larger number are under medical treatment or physician's care in households. As an element of this planning, relocation preferences should be discussed with the administrators of all risk area institutions having at least 50 persons residing in group quarters. All of the larger medically oriented institutions should be assigned space for patients in comparable facilities and housing for institutional staff and dependents in the host county plan.

The planning team, aided by medical professionals, should review the assignments made in the housing plan as they pertain to medical patients and staff for reasonableness and make any necessary adjustments. Other medical facilities, such as clinics, treatment capabilities in correctional institutions, nursing and rest homes and the like should be inventoried as to remaining emergency capabilities. Many of these will not have been committed

to relocatee housing if the procedures suggested in Section 2 have been followed. Lists of facilities should be prepared that can accept patients of various types, can offer outpatient services, or that can provide laboratory or other medical support, including pharmacies.

Plans should be laid to use patient facilities or emergency housing in nursing homes and rest homes in a medically appropriate manner. Most plans should be based on the following considerations. If these facilities are left unassigned in the original planning, assignments can be made in the early stages of a crisis. That is, many smaller institutions not covered in peacetime planning for practical reasons will ask risk area authorities what they are to do when the subject of population relocation becomes a salient issue. A good deal of "last minute" arrangements are likely to be made under these circumstances if host countries are in a position to provide suitable facilities. A second procedure to be planned for is the encountering of relocatees at a rest area or at initial reception where nurses, physicians, or reception personnel may recommend that specific individuals be placed in a specialized care facility rather than provided ordinary congregate care housing. The Health and Medical Service must be in a position to respond positively and promptly to the identification of individuals needing special care. This is best accomplished by planning last minute utilization of appropriate facilities, crowding and other augmentation measures, and, desirably, the identification of certain schools or other institutions as places to be converted into treatment centers, should the need arise.

### Planning Health Care Services

The planning team should review with local medical and health professionals the congregate care housing conditions that can be expected if all assigned risk area residents relocate as planned and if the reassignment of relocated families to volunteered dwellings is negligible. This is presumably the worst case for the development of health problems in the "normal" population of relocatees. Reference 12 of the data package contains planning data on the number of cases of various acute conditions to be expected based on National Prevalence Data, expected increases in incidence of conditions in congregate quarters and as a function of the level of public health measures, and emergency physician-patient ratios. Suggested ways to organize the Health and Medical Service are also contained in Reference 12.

In general, physicians and other medical professionals should be located at the treatment facilities, the patients being brought to them. It is important, however, to establish medical surveillance and initial health care contact where the relocatees are

housed. Nurses, nurses aides, and trained Red Cross personnel are invaluable in this role. At least one such individual per 12-hour shift should be planned at each Lodging Section Office. The number required should be determined by the number of relocatees and the number of congregate care facilities in the Lodging Section. Persons with medical complaints would be instructed to report to this staff at the Lodging Office. In addition, these personnel should visit each facility at least daily to observe conditions and hold "sick call." Persons requiring professional medical attention should be transported to the appropriate treatment center. Inadequate health conditions resulting from lack of cleanliness in sanitation facilities, inadequate supplies, delays in garbage and trash collection, and other causes should be reported through the Lodging Office for correction. The numbers of medical and paramedical personnel required should be compared with those known to be available within the host county. Shortfalls should be recorded for inclusion in the Requirements Statement that will form the basis for plans to allocate risk-area personnel and resources to the host counties.

#### Planning Public Health Measures

Analysis of potable water supplies and sewage treatment effluents, inspection of mass feeding facilities, prompt collection and disposal of trash and garbage, vector control, and other public health measures will require particular attention and augmentation to protect the greatly increased county population when relocation occurs. The State Crisis Relocation Plan should be consulted with respect to plans for relocation of trained staff to host counties and the availability of State health support upon request. This plan package suggests procedures to be used for estimating the augmentation requirements for trash and garbage collection and vector control. Needs beyond the capabilities within the county should be included in the Requirements Statement so that plans can be made to relocate risk area organizations for these purposes.

#### Health Care for Host County Residents

It will generally be found impractical to plan for adequate health and medical care for the relocated population, while at the same time allowing doctors to maintain their own offices and schedules for residents of the host county. On the other hand, residents under medical supervision or having a family doctor are most efficiently handled by their usual practitioner. Since residential areas are included in the Lodging Sections, householders and relocatees within their dwellings should be encouraged to contact the Lodging Section Office for health and medical care. At the same time, physicians and other medical personnel should be advised to inform patients needing their services of their emergency location and availability. In this way, essential continuity of health care

services and practices can be maintained during the relocation emergency.

## REQUIREMENT STATEMENTS

### Medical Treatment and Surveillance

Figure 5-1 shows the suggested form for stating requirements for medical treatment and surveillance.

The Guide envisions medical care in the host area as a two-part operation. In general, those needing professional care by a physician would be brought to a treatment center. But first, those with medical complaints would be interviewed in the Lodging Office -- or visited in their lodgings, if necessary -- to ascertain whether, in fact, they appeared to need professional care. This, then establishes a two-part requirement for medical personnel: treatment personnel at the treatment centers and surveillance personnel at the treatment centers and surveillance personnel in the lodging sections. The breakout of medical personnel in Figure 5-1 reflects this two-part requirement.

For the treatment centers, requirements are stated for physicians and allied health-care personnel. The suggested form lists registered nurses (RNs), practical nurses (LPNs and PNs), and technicians separately. In this, it is taken that the practical nurse category may also include trained or experienced nurses aides. No attempt has been made on the form to differentiate among technicians. However, when the statement is drawn, numbers of the various required skills can be entered in the "Technicians" column and their specialties noted.

Requirements for surveillance personnel have been identified with the Lodging Section in Figure 5-1. In most cases, surveillance personnel would be stationed in the Lodging Office to hold "sick call" there or as a base from which to visit the lodging facilities. However, it may be that some lodging sections would include one or more congregate care facilities housing so many people that the stationing of surveillance personnel in such facilities would be desirable. In that case, the requirements should be identified by facility and summarized for the lodging section as for Reception and Care in Figure 2-9 (Section2).

Additional equipment may be needed from the risk area for medical treatment. Also, it may be necessary to establish treatment centers in other than medical facilities. For these, many items of equipment-autoclaves, intravenous medication stands, etc. - that are relatively portable would be useful and not likely to be locally

## HOST AREA REQUIREMENTS STATEMENT

\_\_\_\_\_ COUNTY

## B. Medical Treatment and Surveillance

## 1. Medical Treatment and Personnel

No. of People Required				
<u>Treatment Center</u>	<u>Physicians</u>	<u>Registered Nurses</u>	<u>Practical Nurses</u>	<u>Technicians</u>
(Facility No. and Name)	xx	xx	xx	x (skill)
(Facility No. and Name)	xx	xx	xx	x (skill)
				x (skill)

## 2. Medical Surveillance Personnel

No. of People Required		
<u>Lodging Section</u>	<u>Registered Nurses</u>	<u>Practical Nurses</u>
(Lodging Office)	x	xx
(Lodging Office)	x	xx

## 3. Equipment

## 4. Supplies

FIGURE 5-1 MEDICAL TREATMENT AND SURVEILLANCE REQUIREMENTS

available in normal supply channels. Requirements for such equipment should be stated by number and location in as much detail as is feasible.

Expansion of medical facilities and establishment of treatment centers in other than medical facilities will pose requirements for the kinds of supplies used in hospitals and clinics and not normally dispensed in retail stores in the host area. Requirements for such medical supplies should be stated -- again by quantity and location.

### Sanitation

Figure 5-2 shows the suggested form for stating sanitation requirements. Sanitation includes the public health measures for assuring safe food and water supplies and healthful surroundings for people.

Figure 5-2 identifies personnel requirements in two ways: numbers of people for sanitarians and vector control technicians, and number of units for trash and garbage removal people. The concept is: sanitarians and vector control technicians can, and do, work as individuals, but garbage and trash removal people operate as organized groups each of which includes: 1 truck, 1 truck driver, and several trash handlers. Therefore, it seems preferable to specify requirements for sanitarians and vector control people as individuals and trash removal in units. This will permit the assignment and relocation of trash removal organizations, complete with their organizational equipment.

Sanitarians are identified by specialty because the specialized needs would likely differ. The requirements for water supply and sewage disposal sanitarians would be affected by the types of water supply and sewage disposal systems as well as by the numbers of relocatees. Similarly, the requirements for food sanitarians would be affected by the food distribution pattern and by the number and capacities of the mass feeding establishments. In addition, the skills of water and sewage, food, and housing sanitarians are not usually interchangeable.

The personnel requirements are stated by the location to which the people are to report or from which they will work. These locations may or may not be staging areas and they may differ for the several specialties.

Equipment -- trash and garbage trucks -- will be required for the units specified in the personnel requirements. If additional equipment of this type is required, the statement should identify them separately to avoid confusion and uncertainty. Earth-moving equipment may be required for new sanitary fills or to expand the handling capacity of existing fills. This requirement may be

## HOST AREA REQUIREMENTS STATEMENT

\_\_\_\_\_ COUNTY

## C. Sanitation

## 1. Personnel

<u>Location</u>	<u>No. of People Required</u>				<u>No. of Units</u>
	<u>Sanitarians</u>				<u>Trash Removal</u>
	<u>Wat &amp; Sew</u>	<u>Food</u>	<u>Housing</u>	<u>Vector Control</u>	
(place)	x	x	x	xx	x
(place)		x	x	x	x

## 2. Equipment

## 3. Supplies

FIGURE 5-2 SANITATION REQUIREMENTS

deferrable until the requirement for such equipment for shelter upgrading and expedient shelter construction has been discharged. If not, it should be stated and a requirement for equipment operators included under personnel. If sanitarians and vector control technicians need to bring their tools -- or the equivalent -- that requirement should be stated.

Requirements for special supplies -- such as insecticides, rodenticides, etc., used by vector control technicians but normally not available in retail stores -- should be stated. So also should any special supplies required by sanitarians. Normally available supplies, such as fuel for trash trucks, that will be distributed through normal channels need not be stated here.

## RISK AREA PLANNING

Since most of the population requiring access to medical care will have been relocated to the host counties, a major part of the Health and Medical Annex to the risk area crisis relocation plan will be devoted to arrangements to provide host county medical support and to the relocation of institutionalized patients and the handicapped. Some emergency medical support should be planned for the risk area in addition to any resident facilities providing health care to nontransportable patients. Since medical aid will be in basic support of essential workers in the operating areas, it should be located primarily at the Staging Areas, along with the mobile medical support. It is suggested that physicians and nurses employed by the local health agencies be assigned these duties in lieu of medical personnel in private practices. If at least one hospital or surgery will be kept operational during the Relocation Period for the care of ICU and CCU patients, it should be feasible to plan for emergency room care at the resident facility in support of risk area operations. These arrangements should be discussed with local health department officials and a plan devised for risk area support inclusion in the operational plan.

In the risk area operational plan, responsibility for mobile medical aid should be assigned to the organization normally responsible for the service. Most often, this will be the Fire Service. At least one rescue truck and ambulance should be assigned to each Staging Area during the operating phase. Additional units are desirable at those Access Control Points that will act as the portals for commuting workers. During the movement and return phases, crews and equipment should be stationed at normal duty locations or along the relocation routes. Apparatus and crews in excess of the needs outlined above should be assigned to the host counties in accordance with the Requirements Statements or in proportion to the number of relocatees assigned.



### Medical Support to Host Area

Medical and allied professional personnel are in private practice, for the most part although a small number are in residence in hospitals and other health care institutions. The basic problem is that these doctors and nurses will relocate along with the general public to the host counties in accordance with the allocation based on where they live. This will result in a great imbalance in most instances because their residences are not well distributed over the risk area. A review of the Requirements Statements for the various host counties should reveal that the medical augmentation requirement is more or less proportionate to the size of the relocating population. Thus, some adjustment in the relocation destination of health care personnel is desirable and, indeed, necessary. Moreover, host county plans are based usually on bringing patients to identified treatment facilities, some existing and some to be converted at the time of crisis. Most medical personnel should know in advance which of these to report to and should be provided lodging for their family in the vicinity. In addition, Section B of the Requirements Statements will usually describe a need for nurses, nurse's aides, or trained Red Cross personnel at the Lodging Offices to be the initial health-care contacts for the relocatees.

Guidance on access to health care personnel should be sought from the city or county health departments. The usual route is through the county medical association. With their cooperation, the home addresses of medical practitioners, registered nurses, and allied medical personnel can be obtained. Often, this information is available in the doctor's and nurse's registries and referral centers that exist in nearly every urbanized area. The minimum planning step is to locate the residences of health care personnel and to compare these with the host counties they would be sent to according to the instructions to the general public developed in the Phase I planning report (item 1 of the data package). The numbers of each category of health care personnel that would, under the general allocation, relocate to each host county can then be compared with the needs indicated in the Requirements Statements. The most likely outcome is that some host counties will have surpluses and others will have deficits in one or more of the health care categories. (Since host area requirements will have been estimated on the basis of emergency standards, there should be an overall sufficiency of personnel. Where this is not the case, the available personnel must be allocated so as to partially fulfill the stated requirements in an equitable manner.) Surpluses and deficits will indicate that some health care personnel must be given special instructions on where to relocate.

Actually, it is desirable that all health care personnel be informed at the time of crisis not only of the appropriate host county destination but also where to report -- even if the total resource is in excess of the stated need. It is essential, however, that a mechanism exists for assuring that enough health-care personnel are assigned to each host county to meet the emergency need as much as possible. Alternative procedures should be discussed with the local government health officials and the officers of the county medical association. It may be that certain individuals are more accessible than others because of their membership in an association or registry. If so, these individuals should be selected for reassignment to redress imbalances. Preparation of emergency instructions directed to such individuals is discussed in Section 10 . To the extent practicable, instructions should be prepared for all health care personnel.

City and county health agencies will usually have a limited number of doctors and nurses on their staffs. These personnel are best assigned to provide medical support at the risk area staging areas. These staging areas are located in the vicinity of clusters of facilities that are to be kept operating during the relocation period. Basic medical support will be required by the essential work force in these facilities.

If, as is not unusual, hospitals and other treatment facilities in the host counties have a relatively small patient capacity compared to risk area facilities, Section B of the Requirements Statements may indicate a substantial need for augmentation of medical equipment and supplies. These may be needed to expand existing facilities in the host counties or to permit the outfitting of converted facilities. Since treatment during the relocation period will be necessarily limited to bona fide emergency health care, the equipment and supply needs can be met by moving some of the items from risk area treatment facilities that are to be wholly or partially closed down when relocation is directed.

The planning team should review the Phase I plans for hospitals and other treatment centers. Generally, the allocation should provide for relocation of most patients, either by release of those not requiring hospital care or by relocation to host area treatment facilities. Some patients in intensive care units (ICU) or cardiac care units (CCU) cannot be transported long distances and, in any event, ICU and CCU facilities are usually unavailable in the more rural counties. Hence, crisis relocation plans will generally provide for continued operation of risk area units or consolidation of patient load into certain of the hospitals. A large share of medical equipment and supplies will be available for meeting the host area requirements. An inventory of equipment and supplies in treatment centers and supply houses should be made in consultation

with local health authorities and a tentative allocation to the various host counties made consistent with their Requirements Statements. The resulting list of quantities, sources, and destinations should be filed for use in planning the movement of equipment and supplies.

### Public Health Support

Section C of the Requirements Statements\* covers public health augmentation needs. The suggested format shows the locations in the host county where various capabilities are needed and the numbers of persons or equipment units needed of various types. One major category is sanitarians for analysis of potable water supplies and sewage treatment effluents, and for inspection of lodgings and mass feeding facilities. These persons are employed in risk area health, water, and sewage departments and private counterparts. They can be individually assigned through their employing agency or relocated to appropriate counties as organizational units. The choice will usually depend on the numbers assigned to a county.

A second major category in Section C is trash and garbage collection. The need will usually be expressed in terms of equipment units. In most risk areas, trash and garbage collection is done by both local government sanitation departments and private sanitation companies. The capabilities of such organizations must be inventoried and compared to the need. To the greatest extent possible, private scavenger companies should be relocated as organizations to particular host counties. Large municipal sanitation departments should be divided into units appropriately sized for the requirements in each host county.

A meeting should be sought with the management of the firm or government department to discuss the host area support needs and to seek cooperation in meeting these needs in event crisis relocation becomes necessary. In the case of government sanitation departments, some plans for relocation may have been developed during Phase I planning based on anticipated needs. The more definite information in the host county Requirements Statements may lead to a modification of relocation assignments. It is best to schedule planning discussions with local government sanitation departments first as they would be in the best position to determine the extent to which private scavenger firms need to be contacted. Garbage and trash removal must be accomplished by organized units consisting of a suitable truck, truck driver, and several trash handlers. When making relocation arrangements with private firms, those firms should be selected whose capacity roughly matches the needs of a particular host county. Thus, the whole firm with dependents can be relocated together. Employees not required for the trash removal function can be used to provide reception and care support. If garbage and trash removal is entirely in private hands, the local health department should be contacted for assistance in making arrangements.

\*See Figure 5-2

Equipment specified in Section C of the Requirements Statements, if any, will be in addition to the garbage and trash trucks included in the statement of unit requirements. In many cases, the equipment specified will be that normally used by sanitarians and vector control personnel in their work. Similarly, supply requirements will relate usually to pesticides and other materials needed by these people. As before, the availability of the needed supplies should be established in consultation with local health authorities and a list of quantities, sources, and destinations prepared for use in planning their movement.

## 6. PUBLIC SAFETY

This section outlines the planning required to provide law enforcement and fire protection during crisis relocation. As is done with the other four basic functional elements of the Emergency Operations Plan, this section is organized with host area planning first, followed by the preparation of requirements statements and then the risk area planning. It is assumed that the planning team will undertake this analysis simultaneously for the entire conglomerate area. However, with the above organization the planning can easily be done in a sequential fashion with the host area first, followed by the risk area. More detailed guidance on Public Safety support of crisis relocation is contained in reference 13.

### HOST AREA PLANNING

A large increase in population of the host county because of crisis relocation will result in greater law enforcement requirements and some special problems in fire protection and control. It should be noted at the outset that although the numbers of people required to establish adequate public safety support are likely to be much larger than the trained forces available to the host county, even with augmentation from risk area public safety forces, many of the necessary duties can be performed by auxiliary personnel. That is, the commitment of a sworn peace officer or trained fire fighter is often unnecessary. It may be useful for the planning team to encourage local public safety officials to view their forces as a leadership cadre in many of the activities to be planned for.

Since public safety support will be the responsibility of the chief law enforcement and fire officials of the host county, the planning should involve the Sheriff's Office, community police departments, local fire protection agencies and their counterparts in the risk area and at the State level.

The structure of the organization for public safety will depend to a great extent on the preexisting governmental organization. Fire and police may be combined or separate. If it is combined, a department with the local city police department and fire departments as suborganizational elements.

If separate fire and police operations are to be used, or if the host county contains a major city, it may be necessary to designate the police or fire department of the major city as the lead agency. In any event, the organizational structure should be countywide rather than separate county and city operations.

Figure 6-1 illustrates a typical organizational structure for both risk and host area.

## LAW ENFORCEMENT FUNCTIONS

The functions of the law enforcement agencies will be similar to their current day-to-day operations, with a few exceptions, however, the total work load will be increased due to the increase in population. The four major functions are categorized as follows:

- Traffic Control
- Property and Personal Security
- Criminal Investigation
- Maintenance of Detention Facilities

Many of the routine police functions can be reduced in scope or deferred for the crisis period. Example of these are: issuences of traffic citations, service of warrants, accident investigations, training, etc. Each of the major functional areas that will require augmentation is discussed below:

### Traffic Control

Law enforcement will have the primary responsibility for curtailing traffic flow from the risk to host areas, supporting the State police or Highway Patrol in enforcing the emergency highway traffic regulations, and dispatching emergency vehicles to clear accidents and assist stranded motorists. The movement plan developed in Section 3 will provide the framework for identifying traffic control manpower and equipment requirements. In general, the control of traffic should be assigned to uniformed officers since their "presence" is particularly effective in obtaining compliance with traffic directions. The three types of assignments that normally will be required are: roving patrols, officers at critical traffic control points, and officers at rest areas.

Close liaison should be maintained with the law enforcement agencies in adjacent counties and consideration should be given to joint central points at the county line. Normally, the local law enforcement agencies will provide staff assistance to the State Highway Patrol in manning the Emergency Highway Traffic Regulation (EHTR) posts which are specified for regulated routes in the State Emergency Operations Plan.

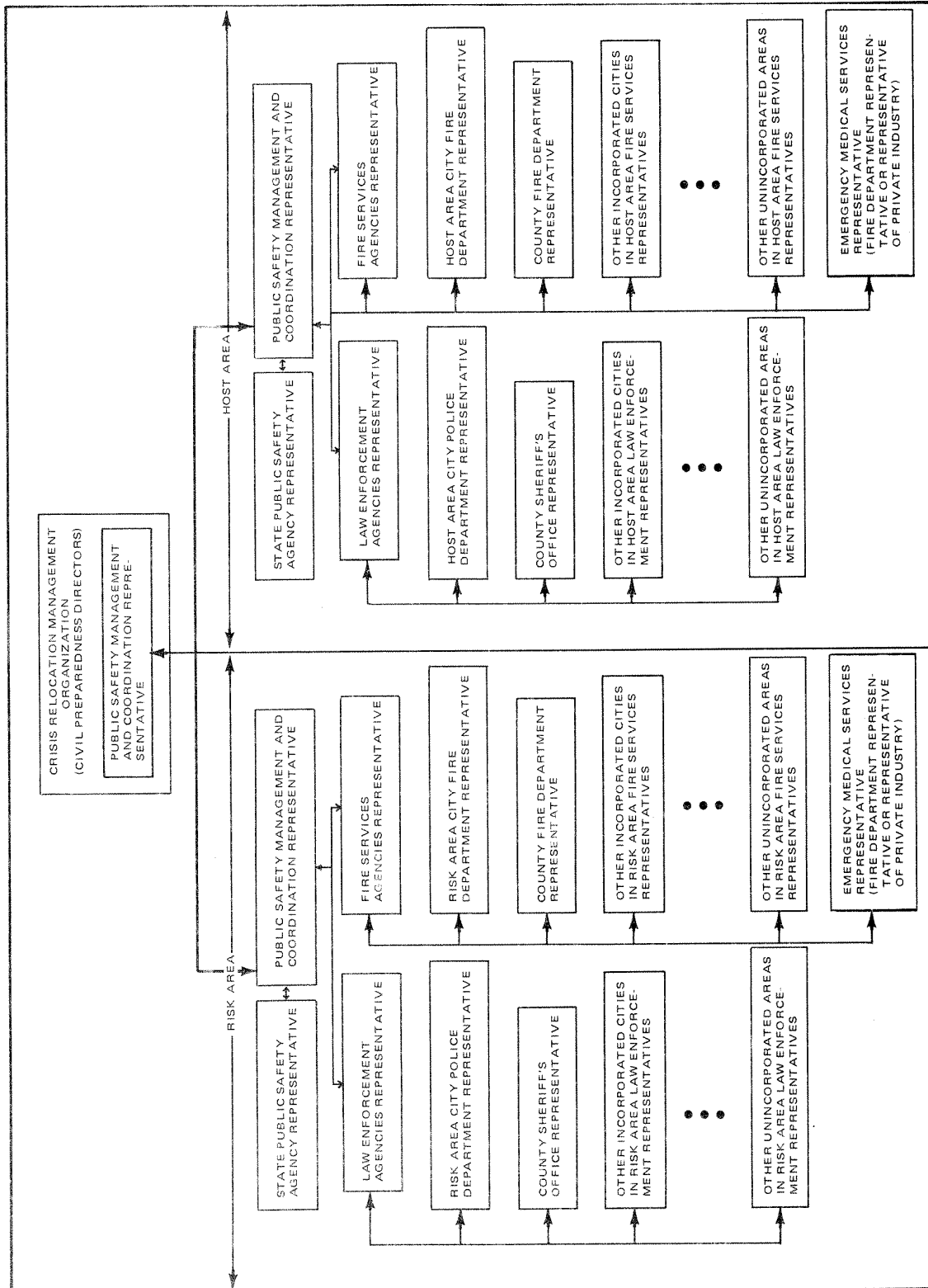


Figure 5-1

### Property and Personal Security

This function will require the use of mobil motorized patrols to provide general security throughout the risk area. These patrols may be manned by one or two officers depending upon the philosophy of the particular law enforcement agency involved. One man patrols obviously provide greater coverage than two man patrols and many communities have reduced vehicles staffing in recent times. However, there are many communities that believe strongly that two men are required for a patrol.

While there are no universally accepted standards for the size of area that a patrol can cover, a number of agencies have used the criteria of a one square mile area (approximately 144 blocks) or in rural areas, a patrol district that can be traversed in three minutes at posted speeds.

Security may also be required for food warehouses and other essential resources in the host area. From a surveillance stand-point, these posts could be manned by auxiliaries, private security guards or even trained volunteers. If non-sworn officers are used, adequate means of communications will be a requirement.

Another point source of security requirements will be the parking areas. Since evacuees will be bringing many of their valuables with them and may have no other place to store them, parked automobiles would be an attractive target for looters. There may also be a requirement to restrict unauthorized vehicle movement in the host area. The assignment of police officers to parking areas would assist in controlling such unauthorized movement.

Temporary or permanent assignment of law enforcement personnel may be required at registration centers and Lodging Sections to control unruly relocatees and to assist in quelling any disturbances that may occur. A mobile unit at the Lodging Section with an officer assigned to the very large congregate care facilities is probably the maximum staffing that can be provided.

At least one "law enforcement monitor" should be on duty in each of the congregate care facilities. In the larger facilities it may be desirable to assign a monitor to each floor. Whether personnel assigned these duties should be deputized should be considered in the planning meetings with the law enforcement agency. Arming of monitors or facility managers is not recommended as necessary or desirable.

### Criminal Investigation

In spite of the preventative measures discussed above, crimes will undoubtedly occur in the host area. Depending upon the conditions in the host area and the characteristics of the relocated



population, the incident of crimes may increase even beyond the ratio of the population increase. The normal criminal investigation sections of the host county law enforcement agencies will probably have to be expanded to handle this increase in work load. It would be logical to reassign risk area staff familiar with criminal investigation to provide this augmentation.

#### Maintenance of Detention Facilities

Additional security staffing at detention facilities may be required either because of increases in arrests for criminal violations in the host area or because of the relocation of risk area prisoners. In the first case, it is difficult to determine in advance the increase in workload that may result. In the second case, coordination with risk area law enforcement staff will indicate the disposition of risk area prisoners. If they are to be relocated, then it must be decided whether they will merely be incarcerated or used for labor in the host area.

In both cases above, provision must be made to house the prisoners in existing or expedient jail facilities. If the prisoners are used as host area workers, plans must be made to utilize them and to provide security for them while on work detail.

#### FIRE PROTECTION AND RESCUE FUNCTIONS

The fire protection and rescue functions in crisis relocation are generally the same as those performed by the fire service in normal operations, with the possible exception of the mobile medical responsibility. The major functions are listed below and described as follows:

- Fire Prevention
- Fire Suppression
- Rescue
- Mobil-Medical \*

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\* Mobile-Medical services are discussed here and in Section 5. For those communities where ambulances and/or paramedic service is provided by the Health Department or by private companies under contract to Health Departments, this function should be included in that service.

### Fire Prevention

Fire prevention activities will increase substantially in the host area due to the increase in population and the conversion of non-residential buildings into lodging facilities. The fire service will have two major functions in fire prevention - inspection for fire hazards and education of the relocatees on fire prevention techniques.

Inspection for fire hazards should commence in the host area immediately upon receipt of the order to evacuate the risk area. Fire inspection personnel may have participated in the on-site inspection of congregate care facilities, and if so, they will have made observation on occupancy restrictions, fire exists, availability of fire standpipes, etc. If this was not done, it should be a first priority in the relocation phase.

Continuous inspections should be made throughout the standby phase to identify and correct hazardous fire safety infractions caused by the relocatees. Since many of the buildings used for congregate care are not normally equipped for lodging, it is anticipated that relocatees will be "jury-rigging" electrical circuits, heating, and cooking facilities in the congregate care spaces. In addition, movement of furniture, supplies and equipment in these congregate care facilities may impede exists or produce unsafe fire conditions.

At the same time these fire inspections are conducted, relocatees should be instructed on fire safety techniques and educated on what to do in case of fire.

### Fire Suppression

The suppression of fires in the host area is more important than ever because of the crowded living conditions and the lack of fire fighting support features in the non-residential building used for lodging. It is estimated that in excess of 30 percent of all urban fires are caused by peoples carelessness. That, combined with the atypical living conditions in congregate care facilities, suggests that the incidents of fire will increase at a rate approaching the ratio of relocatees to host residents.

The increase in engine companies that will be required because of the anticipated higher incident of fires is difficult to determine since there are no generally accepted standards for this situation. The existing fire fighting resources are generally distributed throughout the host area on the basis of previous fire experience and it is likely that this distribution (although not ne-

cessarily the number of companies) is adequate for crisis relocation conditions. The final determination on increased requirements for engine companies must be made by the local fire service agency.

It is reasonable to suppose that fire incidences will be reduced in the risk area and that some of that equipment can be relocated to the host area. However, many risk area fire departments believe that this reduced incidence will be compensated for by poorer detection since the majority of people will have evacuated and therefore the risk areas total demand for fire companies will stay the same or increase.

Another demand that will be placed on host fire services will be the need to respond to automobile fires that are occasioned by the relocation. Many of the autos used in the evacuation will be in poor conditions and they often will be operated in stop-and-go traffic. Consideration should be given to stationing fire units at the rest areas along the evacuation routes to respond to these fires.

### Rescue

The rescue function is also anticipated to increase both during the evacuation and in the standby phase. Increased auto travel may cause an increase in automobile accidents during evacuation depending upon the number of automobiles and the type of vehicle conflicts that occur. Therefore, consideration should be given to the need to position rescue units near the major access routes for the evacuees.

During the standby phase the number of incidents requiring rescue response should increase due to the unfamiliarity of the relocatees in the area.

While it is not currently possible to estimate the increase in rescue unit activity in crisis relocation consideration should be given to relocation of rescue units from the risk area where the demand for such services will be severely reduced. These rescue units should be distributed to the host area on the basis of population.

### Mobile-Medical Aid

The incidence of ambulance calls under normal conditions varies by type of (rural/urban) season of the year and between geographical regions of the country. It is anticipated that excitement, stress,

and unusual physical activity will increase the incidents of medical problems such as heart attacks. Also the increased automobile travel in the relocation phase may cause an increase in accidents, however, with predominately one-way flow, the incidence of serious accidents, such as in head-on collisions, may not increase.

In Emergency Medical Services (EMS) studies in California, it has been found that Code 3 ambulance calls (those requiring red light and siren) occur at the rate of five per day per 100,000 population. This rate can be used as a surrogate value to estimate the minimum number of calls that might be expected in the host area.

From the same EMS studies, it is estimated that there are six ambulances per 10,000 persons in urban areas and sixteen ambulances per 10,000 persons in rural areas. However, many of these ambulances are used for routine purposes and actual demand for Code 3 calls is about one-fifth of that number. Since the conditions in the host area are somewhere between normal urban and rural conditions, it is suggested that the Crisis Relocation Plan requirement be in the order of two ambulances per 10,000 persons. For host areas without adequate hospital facilities it may be necessary to transport patients to distant medical facilities which will increase the ambulance requirements proportionately.

### Summation of Requirements

The planning team should prepare a worksheet similar to that shown in figure 6-2 to summarize the personal, vehicles, and equipment need to provide law enforcement and fire and rescue support in the host area. The various functions - traffic control points, rest area operations, mobile medical aid, etc. - should be placed as headings in the location column. Under each heading the locations should be specified. For each location, the personnel per shift, vehicles, and equipment should be identified. Personnel should be classed as regular or auxiliary.

Upon completion of the foregoing public safety support planning the planning team should compare the manpower, equipment and supply requirements that have been generated with the capabilities available within the host area. Reasonable assumptions should be made to augment regular forces during a crisis. Shortfalls should be identified for inclusion in the Requirements Statement.

## REQUIREMENTS STATEMENTS

Requirements statements for public safety should be separate for law enforcement and fire protection. In completing these state-

Location	Personnel (per shift)		Vehicles	Equipment & Supplies
	Regular	Auxiliary		
TRAFFIC MONITORS				
Rt. 115 at County Line	1	1	1	Radio; log
Between County Line and K St. Diversion	3	3	3	Radio; flares
Between K St. and Rest Area #1	2	2	2	Radio; flares
*	*	*	*	*
*	*	*	*	*
*	*	*	*	*
TRAFFIC CONTROL POINTS				
K St. Diversion at Rt. 115	1	5	1	Radio, direction
K St. and Main, Penrose	0	1	0	Signs, flares
K St. and Rt. 50	1	1	0	Auxiliary lights
Rt. 115 and Rt. 50	1	1	1	
*	*	*	*	*
*	*	*	*	*
*	*	*	*	*
REST AREAS				
	2	17	2	Radio; direction
				Signs, flares, auxiliary lights
RECEPTION CENTERS				
*	*	*	*	*
*	*	*	*	*
*	*	*	*	*
*	*	*	*	*

Figure 6-2 MOVEMENT PHASE WORKSHEET

ments specific consideration should be given to minimizing the requests to the risk area for support since both of these services will be maintained in the risk area during the standby phase.

In that regard, the apparent requirements should be examined to determine if some of the functions requiring augmentation are sequential in nature.

For example, the critical workload on traffic control occurs during the movement phase. If the requirements for this phase can be met, those requirements for movement control for the standby phase usually can also be met. Therefore, the requirements for law and order personnel for traffic control should be based on the movement phase. When the movement is complete, the personnel can be reassigned to their standby phase duty stations.

Figures 6-3 and 6-4 are suggested formats for stating fire and law enforcement support requirements. Note that the categorization of support requirements differs for some functions. This is illustrated on Figure 6-3 where fire inspectors are listed in terms of numbers of people since they work as individuals. Fire fighting, however, requires a team with organizational equipment and therefore they are requested as fire companies. More specifically they should be designated as engine companies since truck companies will normally remain in the risk area to fight fires in large buildings.

## RISK AREA PLANNING

The public safety requirements in the risk area will probably increase during the movement phase and then reduce substantially during the operating phase. The actual workload will depend on a number of factors unique to each risk area. Namely, the number of essential operations remaining in service, the number of "stay-puts", and the judgement and perception of the risk area public safety officials.

In developing manpower requirements it should be remembered that like everything else in crisis relocation, a "business-as-usual" approach must be avoided. Police departments normally operate on a three shift basis with roughly five men required to maintain one man on duty. By shifting to two 12-hour shifts and suspending normal leave and administrative assignments, the effective work force can be doubled. The increase in manpower can be used to accommodate increase workloads in traffic control in the risk area or for assignment to host area law enforcement organizations.

## HOST AREA REQUIREMENTS STATEMENT

\_\_\_\_\_ COUNTY

## E. Firefighting

## 1. Personnel

	No. of People Required	No. of Units
<u>Location</u>	<u>Fire Inspectors</u>	<u>Fire Companies</u>
(place)	x	x
(place)	xx	x

## 2. Equipment

## 3. Supplies

Figure 6-3 FIREFIGHTING REQUIREMENTS

## HOST AREA REQUIREMENTS STATEMENT

\_\_\_\_\_ COUNTY

## F. Law and Order

## 1. Traffic Control Personnel \_\_\_\_\_

## No. of People Required

<u>Location</u>	<u>Policemen</u>	<u>Traffic Monitors</u>	<u>Guards</u>
(place)	x	xx	xx
(place)	x	x	
(place)	x	x	

## 2. Security Personnel \_\_\_\_\_

## No. of People Required

<u>Location</u>	<u>Building Guards</u>
(place)	xx
(place)	xx

## 3. Equipment

## 4. Supplies

Figure 6-4 LAW AND ORDER REQUIREMENTS



Due to the fact that fire services often operate on 24- or even 48-hour shifts the same effective increase in their staff may not be possible.

Unfortunately, there are no generally accepted standards for the level of staffing or equipment needs for the situations postulated in crisis relocation. Also, there will be many unanticipated demands placed upon the public safety services merely because of their superior organization and discipline. These characteristics are invaluable in assigning responsibility for managing numerous emergency situations often not primary missions of the public safety agency. For example, the fire service is particularly experienced in managing large numbers of personnel and equipment at a fire. They may be called in to manage the scene of a major medical disaster even when the rescue function is actually minor, since they are often more experienced field managers than physicians or other health personnel.

### Law Enforcement Functions

The functions of law enforcement agencies are similar in character to their current day-to-day operations, however, the actual methods for conducting these operations will be changed by the crisis conditions. The three major functions are categorized as follows:

- Traffic Control
- Private Property and Personal Security
- Protection of Essential Industry Sites

The general organization shown in Figure 6-1 indicates the central organization required for these functions. The law enforcement departments will undoubtedly have to be augmented with auxiliaries and private protection agencies. A discussion of these functions and typical planning factors for analyzing their organizational or staffing demands is discussed below:

### Traffic Control

The movement plan developed in accordance with the guidance in Section 3 will form the basis for planning manpower and equipment deployments for expediting the relocation movement. The Emergency Highway Traffic Regulations (EHTR) promulgated by the State will also contain specific requirements. Movement control will also be required for commuting and in the return phase, however, these last two will be substantially less demanding.

Each of these phases of movement control must be well coordinated with adjacent jurisdictions and responsible State agencies. In addition coordination must be maintained with the State and local Road Departments who will be responsible for placing barricades, signs, and modification of traffic signals as necessary. Similarly, the control and disposal of wrecks should be at least coordinated or more properly managed by law enforcement.

The specific objectives of the traffic control functions are:

- Expediting the flow of traffic
- Detecting and correcting traffic problems
- Assisting at the scene of auto accidents
- Providing for movement of priority traffic
- Enforce traffic restrictions
- Monitoring movement operations and providing their information to the EOC

In order to accomplish these objectives the following planning considerations should be kept in mind in order to conserve and efficiently use resources. The use of personnel to direct traffic should be minimized to the greatest possible extent. In responding to traffic incidents on the evacuation routes motorcycles are much more mobile than squad cars. Where possible, disabled cars should be moved to the side of the road by hand or pushed by other cars. Occupants in disabled cars should be assigned to other low occupancy vehicles or taken to a staging or rest area for pickup by public transportation.

Monitoring of movement operations will require field observation from control points, however, use should also be made of traffic count machines (to be provided by the Road Department) and of surveillance aircraft to provide both spot surveys and overall condition reports.

#### Private Property and Personal Security

The dimensions of law enforcement support during the operating phase will depend in part on the numbers of risk area residents who fail to relocate as directed. Observation of traffic flow on the outbound routes may provide some preliminary indication of the stay-puts remaining after the movement phase is essentially complete. House-to-house enforcement of relocation is neither possible nor warranted. Public policies to discourage stay-puts include curfews

and unavailability of food, fuel, and other necessities except at the Staging Areas. These policies should be announced through the mass media periodically during the Preparatory Period and during the movement and operating phases. Residents found on the streets or reporting to a Staging Area should be encouraged and aided to relocate to their assigned host county. Detention should be at the discretion of the responsible authorities in the EOC except where criminal acts have been committed.

During the operating phase, aerial surveillance of the risk area by helicopter or light aircraft will be found far more efficient than street patrols. Detection of fires is also best served by this means. Because traffic in the risk area will be negligible except in operating areas and on access routes, patrol vehicles can respond to incidents more rapidly than normal and can take responsibility for areas perhaps three times as large as in normal practice. Street patrols would still be required to detect unlawful activity through periodic observation of sensitive retail establishments, such as food, liquor, jewelry, and department stores.

In the earlier discussion of host area security, a planning factor of one patrol per square mile was used for urban areas and in rural areas a patrol district sized so that it could be traversed in three minutes. Since the risk area will be relatively empty then the threefold increase in coverage mentioned in the paragraph above would result in patrol districts of three square miles in urban areas and approximately 30 square miles in rural areas.

#### Protection of Essential Industries

During the on-site to essential industries information will be obtained on security requirements both existing and anticipated in crisis. Where operating facilities do not have their own guard service law enforcement officers should be assigned to these facilities that have defense related functions. Consideration should be given to assignment of officers to other essential operations within the limit of available manpower (taking into consideration both risk operations demands and host area requirements statements). Where manpower is unavailable for this function, the mobile patrols sited above should be instructed to regularly inspect these facilities.

Auxillaries and trained volunteers may be suitable for these security functions at the less sensitive facilities. These unsworn personnel can also be used as the second member of two-man patrol teams.

### Fire Protection and Rescue Functions

These functions are similar to those described earlier for the host area. The major function categories of fire detection, fire suppression, rescue, and mobile-medical aid are discussed below:

#### Fire Detection (Prevention)

Relatively little effort can be devoted to fire prevention after relocation takes place. During the pre-crisis phase including the period ending with the evacuation, the public information program should stress the actions necessary to prevent the start of fires in facilities being left unattended. Once the movement phase has begun the risk area fire service will be concentrating on detection of fires.

With the majority of residents evacuated from the risk area, the normal source of fire reporting will be reduced substantially. This is most serious since fires undetected in their early stages can quickly spread over a wide area particularly in dense urban environments. It is recommended that the fire service and law enforcement cooperate in establishing dual purpose patrols that will simultaneously look for fires and security problems. Aerial surveillance is also desirable as a dual use operation.

Once the evacuation has been completed the potential for fire starts will shift from the unoccupied buildings to the occupied operating areas. It is recommended that rigorous fire inspection be made of all essential operating areas and that special fire prevention instructions be given to the workers. For those facilities considered most essential it may be desirable to pre-position fire equipment and personnel at these facilities. The pre-positioned equipment would still be available for dispatch as needed to other locations, however, their immediate availability could mitigate the effects of a fire in the essential industry. The fire personnel could also provide a dual rate of backup security patrols for the essential facility.

#### Fire Suppression

The character of fires in the risk area will probably change after evacuation. Analysis of fire incident data indicate that over thirty percent of building fires are caused by people oriented causal factors. With population evacuated, the people initiated fires will be reduced to the level of the "stay-put" population and essential workers.

However, the fires that do occur can be expected to be larger in size because of the problem of early detection. In addition,

the tactics to be utilized to suppress these large fires will probably change also. Large response teams will be required and they will often concentrate on protecting exposures and "knockdown" techniques rather than the usual effort of extinguishing the fire and saving the structure. Control and containment efforts will minimize time commitments as will the deferral of overhaul and cleanup activities.

The rationale for this approach is that augmented fire defenses in the host areas where risk area residents have been relocated are so essential that every effort must be made to streamline and skeletonize the forces committed to fire protection in the risk area.

Redeployment of risk area fire companies so as to provide the best balance of fire defenses in both risk and host areas will undoubtedly be the most difficult aspect of Fire Service planning. It may be found desirable to convene planning meetings of fire officials and planners from both risk and host areas to work out a best solution. Fire department manpower and equipment strengths in urbanized areas are generally a compromise between desired grades established by the American Insurance Association and the costs that can be borne in municipal budgets. In theory, at least, manpower is directly related to the apparatus provided, with a recommended strength of five men per engine company and six assigned to ladder trucks. A duty force of 40 men per 100,000 population is representative of most cities today. In outlying parts of most risk areas, fire companies are mainly volunteer units.

Although fire protection and suppression is a very local function, most departments have highly developed mutual aid arrangements over fairly wide areas. Objective consideration of the fire defense implications of crisis relocation, with urban fire officials recognizing fully that the fire-state potential is being relocated with the population, should result in a reasonable redeployment scheme. In developing the optimum deployment of forces, full consideration should be given to the existence of industrial fire brigades, some of which will be attached to nonessential facilities, and to forest land and brush land fire apparatus that can be integrated into the scheme.

#### Rescue Mobile-Medical Aid

The demand for rescue and mobile-medical aid is expected to increase during the movement phase and then decline rapidly after the population has been evacuated. Augmentation of normal emergency ambulance equipment and personnel will be required during the movement phase. The only significant resources for this augmentation will be the private ambulance companies that normally handle routine transfers between medical facilities. As a general rule the ratio in non-emergency ambulances to emergency ambulances is on the order

of one to two. Therefore, there is a potential increase of 50 percent from these sources. Specific data on ambulance inventories is usually available from the State Department of Motor Vehicles, State or local police, or the risk area emergency medical services planning agency.

Other sources of substitute vehicles for ambulances are panel trucks and vans. The use of station wagons should only be considered as a last resort since they do not provide headroom for the medical technicians to attend the patient.

Equipment to supply the substitute ambulances will have to be provided. Minimum equipment lists are available from the American College of Surgeons. The primary sources of this equipment are the local ambulance supply companies and fire companies relocating to the host area.

Staffing for substitute ambulances should include one driver (who does not need special medical training) and a medically trained technician, ideally a certified Emergency Medical Technician I. If EMT-I personnel are not available, Registered Nurses, which are generally in abundant supply in the risk area, should be recruited.

In the operations or standby phase the demand for ambulance and rescue units will be proportional to the remaining population in the risk area. Assuming that critical workers are eight to ten percent of the population and that only fifty percent of them are in the risk area at any one time, they will constitute five percent of the original demand. There is no planning factor for the anticipated number of "stay-puts", however, estimates have varied as high as twenty percent. Lacking better data these numbers could be used as a surrogate for risk area demand. This would mean that seventy-five percent of the medical-rescue equipment could be transferred to the host area to support the relocated population.

### Documentation

When a satisfactory public safety plan has been developed for both the risk and host area, the planning team should document the details for use in preparation of the Fire and Law Enforcement Annex's and department Appendices of the risk and host crisis relocation plans. The planning report discussed in Section I should be the vehicle used to provide this documentation.

## 7. RESOURCE AND SUPPLY

This section outlines the planning required in providing and maintaining control of essential goods and services during the Relocation Period. It also discusses the need for economic controls. As is done for the other sections which discuss the five basic functional elements of the Emergency Operations Plan, this section is organized with host area planning first, followed by the preparation of requirements statements and then the risk area planning.

### HOST AREA PLANNING

As discussed more fully in Section 9, it is recommended that the several agencies concerned with procurement of supplies, engineering services, manpower, transportation, and accounting be organized for coordination purposes within a Resource and Supply Service upon which the other Services can call for support. The matters discussed in this section are among the important functions of this Service.

Typical participating organizations in the Resource and Supply Service are county and city road, parks, street, water, sewage treatment, and sanitation departments and districts, county clerk and planning offices, electric and gas utilities, bus and trucking firms, wholesale and retail outlets, automotive sales and service companies, fuel suppliers, and elements of appropriate State agencies. The planning team should enlist the aid of such organizations as appropriate in developing effective plans.

### Essential Supplies and Services

Table 7-1, is a listing of typical essential supplies and services. The continued supply of these supplies and services in quantities adequate by emergency standards is a major element of the State Crisis Relocation Plan. This plan should be reviewed by the planning team with local participants. The basic approach in the State plan is to use to the greatest extent practical the normal distribution channels for these items. For those items that move by truck or rail, the effect is to extend the distances that goods must be transported from the warehouses to the points of use in the host county. This places considerable stress on transportation resources, with the result that nonessential transportation must be curtailed and diverted to priority uses.

Thus, it must be made clear in the plans that wholesale and retail outlets for nonessential goods and services cannot expect

Table 7-1

## ESSENTIAL SUPPLIES AND SERVICES FOR CRISIS RELOCATION

1. Health Supplies and Equipment
  - a. Pharmaceuticals
  - b. Blood Collecting and Dispensing Supplies
  - c. Biologicals
  - d. Surgical Textiles
  - e. Emergency Surgical Instruments and Supplies
  - f. Laboratory Equipment and Supplies
2. Food
  - a. Milk
  - b. Meat and Meat Alternatives
  - c. Vegetables and Fruits
  - d. Grain Products
  - e. Fats and Oils
  - f. Sugars and Syrups
  - g. Adjuncts
3. Body Protection and Operations
  - a. Personal Hygiene
  - b. Portable Lighting
4. Electric Power
5. Fuels
  - a. Petroleum Products
  - b. Gas
  - c. Solid Fuels
6. Sanitation (Including Sewage Treatment) & Water Supply
  - a. Water and Sewage Treatment
  - b. Water supply & Sewage Treatment Materials
    - (1) Coagulants
    - (2) Disinfectants
    - (3) Miscellaneous



Table 7-1 (Continued)

- c. Insect and Rodent Control Materials
    - (1) Insecticides
    - (2) Rodenticides
  - d. General Sanitation Materials
- 7. Housing and Construction Materials and Equipment
- 8. General Use Supplies and Equipment
  - a. Batteries
  - b. Tools
  - c. Construction Equipment
  - d. Trucks
- 9. Transportation
- 10. Telecommunications
- 11. Defense-related Production and Services

replenishment of stocks or to continue to supply normal services. That is, deliveries will not be made to, say, furniture stores, dress shops, or automobile sales agencies during the relocation period unless the deliveries were on the way prior to the relocation order. Similarly, movement of household goods, for example, will be suspended and the vans employed for the transportation of essential goods. Manufacturing firms and production units in the host county may not receive inputs or be able to ship products unless these are on the essential list. Moreover, producers in the host county that normally supply food products and essential consumer supplies to the risk areas will be instructed to confine deliveries to the host counties. Current policies affecting economic activities under relocation conditions are contained in the State plan and in Reference 14.

The planning team, with the assistance of county officials, chambers of commerce, and the USDA County Defense Board (for farm and food products), should analyze the economic activities of the host county in light of the guidance in the State plan and reference 12 and develop lists of employing organizations that are likely to be affected by crisis relocation: those that must be kept functioning for purposes associated with the essential supplies and services listed in Table 7-1; those that could be diverted to essential activities (such as transportation firms); and those whose operations are nonessential and may be adversely affected during crisis relocation. As a general rule, planning should be based on the assumption that it is desirable to maintain as much of the economic activity and employment of the host county as is consistent with the need to give priority to essential goods and services. Thus nonessential industries that have inventories of materials at hand and can suffer a several-week delay in product delivery should be assumed to continue in operation. Some service industries such as barber shops and beauty parlors may expand operations by hiring relocated barbers and operators. Others such as realtors, may remain in operation but with few prospects of business. Estimates of potential manpower for emergency tasks from idled employees of nonessential activities should be made. The Bu Census publication, County Business Patterns, may be of use to the planning team, in conjunction with local knowledge, in assembling this analysis and the associated lists. In addition, a tabulation of industries deemed essential may be supplied to the planning team by the State for each county and town within the county. The source of the tabulation will be based on directives by DCPA Headquarters and from the Economic Resources Profile published by Dunn & Bradstreet. Planners, however, cannot assume that the local vital facilities lists as received are entirely accurate. They should be regarded as a starting point, but since some establishments go out of business while others start, will be a good source for the check, or it may be prevailed upon to actually do the checking. Additions to, or deletions from the lists

should be made as needed. It is also advisable to collect data on warehouse sizes, fuel tank capacities, general stock levels, etc., all of which will be invaluable if crisis relocation of the population should take place. Additionally, knowledge of these vital installations is helpful so that adequate protection measures to guard the stocks of these facilities may be taken.

### Health Supplies and Equipment

Supplies of drugs, pharmaceuticals, and other health supplies in quantities adequate to the crisis relocation situation in the host county will be delivered during the relocation period to normal users or retail outlets by their usual suppliers, for the most part. Delivery points are typically hospitals, clinics, and pharmacies. Local wholesalers may be involved if they are presently involved. The types and quantities to be shipped are based on the total county population -- residents and relocatees -- indicated in the State Crisis Relocation Plan and recommended emergency planning factors for the various items. The planning team should review the State plan and the usual delivery points within the county in conjunction with the medical support plan to determine whether changes in total population or their location or medical support arrangements would indicate significant changes in quantities or delivery points. With respect to delivery points, it should be recalled that changes can be effected at the staging area for individual deliveries based on actual requirements at the time. Proposed changes should be forwarded for consideration by State Health authorities.

Security requirements for controlled drugs, scarce or dangerous health supplies and fragile or specialized equipment should be reviewed. Wherever control or safe storage is questionable, especially in commercial pharmacies, needs for security guards or patrols should be identified for use in planning public safety support. Standard prescription methods of controlling the issuance of supplies should be assumed.

### Food Supplies

As with health supplies and equipment, deliveries of food and associated products (paper products, cleaning materials, and the like) will be made by normal suppliers to normal retail outlets or users. Large food chains will continue to supply their outlets in the host county. Institutional suppliers will continue to supply the institutions and commercial eating establishments with which they normally do business. Chains with outlets in the risk area but none or few in the host county will generally be added to the institutional suppliers on the basis that mass feeding requirements

will increase greatly.

The proportion of relocatees that will take meals in private residences as opposed to institutions and commercial eating places is the main uncertainty in the flow of food deliveries. Since the restructuring of the distribution system is based on the principle that channels supplying risk area residents will continue to supply them in the relocated mode, transfers of food and kindred products from retail outlets to institutions, if this is necessary, must take place at the local level. This will be a principal planning concern for the host county. Decisions must be made, and reflected in the host county plan, as to whether delivery vehicles will be redirected at the staging areas to schools or other major mass feeding locations as needed at the time or to feeding establishments as needed. This problem will persist only until the proportion of relocatees in private residences has been established and the demands at retail outlets and feeding facilities have been stabilized. Although major food chains and some institutional suppliers have automated ordering systems, the local resource organization must plan specifically to inform the State of changes in the characteristics of demand.

Procedures for accounting and paying for food deliveries, as well as other essential supplies and services, will be defined in the State Crisis Relocation Plan. Generally, a record-keeping process will be adopted for use in resolving accounts after the crisis in order to relieve pressures on the banking system. Some form of rationing and price control will probably be incorporated in the State plan for appropriate supplies and services. Food stamps may be used as a form of ration document or as a substitute for payment for those residents and relocatees unable to pay for essentials. These or other forms of certification will be issued through the Lodging Offices.

Provision of security for food stocks and other scarce essential supplies will be required. The planning team should identify the facilities requiring security guards and estimate the personnel requirements for use in planning public safety support. These facilities will probably include staging areas, retail outlets, and mass feeding establishments.

#### Electric Power and Fuels

Arrangements for the supply of electric power, gas, and solid fuels are made in the State Crisis Relocation Plan in coordination with the industries concerned. Specific plans for these supplies and services need not be included in the host area plan. The major

concern at the host county level is with the control of motor fuel usage within the area. The transport of essential supplies into the county and the operation of construction equipment in developing and improving fallout shelter will place stress on facilities to supply diesel fuel. Long-haul trucks may be fueled in the risk areas primarily, if specified in the State plan, but backup capabilities must be available in the host county. State Highway Department and county road commission equipment yards and garages, as well as private construction firms, will usually have storage tanks and pumps. They will also have fuel trucks, as much equipment is fueled on-site by this means. An inventory of these capabilities should be made and plans developed to control use to essential purposes. One or more fuel trucks should be allocated to staging areas to provide for refueling of trucks. In areas where heating oil is used for many residences, much of the product, tanks, and trucks are convertible to support of transportation and construction equipment.

The rationing of gasoline to private vehicles is probably not an effective control. The measures suggested in Section for controlling the use of private vehicles through trip or use authorization is probably the best solution when combined with attention to the provision of public transportation to meet well-defined needs for movement. If the host county is one that will be involved in the commuting of essential employees to operate risk area facilities, it may be possible to refuel any private vehicles required in the risk area rather than transport gasoline to the host counties for this purpose. Since shortage of gasoline can arise during the relocation period, plans will necessarily include means for giving priority to public safety and other essential local needs.

#### Construction Materials and Equipment

Sources of housing and constructions materials and general use supplies, as defined in Table 7-1, such as lumber and building materials yards and hardware outlets must be identified and controlled so that uses are for essential purposes, mainly in the development of adequate fallout protection for residents and relocatees. Construction activities in the host county at the time of relocation will generally cease and personnel, equipment, and supplies diverted to essential purposes. The engineering elements of the Resource and Supply Service will control the use of these capabilities. In addition, construction capabilities in the risk area will be allocated to the various host counties to augment local capabilities.

#### Transportation

Long-haul transportation of supplies and equipment to the host

county will be coordinated by the State. Transportation of commuting workers to and from the risk area, where this is planned for the host county, will be the primary responsibility of the risk area planners. The main concern of the host county planning team should be to inventory transportation capabilities in the host county and to plan for their use in support of the movement control plan and in local distribution of essential supplies. Requirements in these areas should be compared with available equipment and drivers and plans adjusted to make them compatible.

#### Other Essential Supplies and Services

Other items on the list in Table 7-1 should be reviewed by the planning team to ensure that they have been adequately identified and provided for in the basic analysis and resulting lists of facilities and organizations that must remain in operation. Specialized sanitation supplies are mainly of concern to governmental units or public utilities. The medical support analysis of Section will be useful in judging capabilities and estimating requirements. Telecommunications, such as telephones and radio, as well as defense-related production, are covered in the State planning. The State plan and associated guidance should be consulted in this regard.

### REQUIREMENTS STATEMENT

Requirements statements for general resources and supplies will be prepared in a manner similar to that discussed in the earlier sections. In general, the specifications and quantities of personnel, supplies, and equipment should be noted on a form similar to that shown in Figure 7-1.

### RISK AREA PLANNING

#### Planning for Movement Support

Prior to departing the risk area, relocating households will need to have access to sources of food and other essentials to be taken with them to the host counties and will need a full tank of gasoline. Emergency information and guidance provided to the risk area residents through the mass media throughout the crisis should urge such preparations well in advance of any directed evacuation. Nonetheless, the speed of crisis buildup, delays in imparting the information, and natural procrastination make it prudent to plan to continue the availability of essential goods and services during

## HOST AREA REQUIREMENTS STATEMENT

\_\_\_\_\_ COUNTY

## G. Other

## 1. Personnel

---

 No. of People Required
 

---

Location(skill)(skill)(skill)

(place)

x

x

xx

## 2. Equipment

## 3. Supplies

FIGURE 7-1 - OTHER SUPPORT REQUIREMENTS

the movement phase after relocation has been directed.

This is not a simple planning task, as retail store employees and service station attendants are likely to be among the first to decamp. Indeed, higher-than-average rates of absenteeism among retail trade workers is used as a sensitive indicator of public behavior in a crisis. How to best assure that a basic set of service stations, supermarkets, and drugstores remain open during the first few days of relocation is a problem to be worked out with local government and representatives of retail groups: associations, distributors, and retail chains. Backup operation by management employees (as in strikes), providing additional manpower from government agencies not otherwise fully utilized (including school personnel), and other local options should be explored fully. Early mobilization of Staging Areas to serve relocation needs may relieve some of the load on area-wide outlets. Finally, an orderly procedure for store and station managers to deposit keys with the police or some other local agency should be worked out.

Retail organizations will be in the best position to recommend how many stores and service stations should be kept open during the movement period, with the personnel scheduled to relocate with their dependents on the third day. For example, supermarket data shows that more than 75 percent of the Nation's food purchases are made between Thursday and Saturday, with the peak occurring between 6 p.m. and 9 p.m. on Friday, when nearly 14 percent of the week's volume is sold. Hence, to the extent of inventory and resupply, there is much unused capacity for emergency purposes.

Similar data indicates that service station stocks of fuel and that in the local pipeline are more than adequate to top off the relocating vehicles. National statistics indicate that the average automobile is driven 33 miles per day. The average vehicle has a range of about 250 miles and, hence, must be refueled at least every week or so. Most drivers go to service stations more often than absolutely necessary; every five days on the average. If all automobiles are serviced on the average every five days, then the relocating first automobiles -- typically three-fifths of the entire fleet -- can be fueled and serviced in three days. The rate is the same -- one-fifth of the entire fleet per day -- under both normal and crisis conditions. Since service stations operate considerably below capacity most of the time and few remain open 24-hours-a-day, only a fraction of the existing stations in the risk area must be programmed to continue to provide service.

#### Planning for supply Support

In addition to the supply aspects of movement support discussed above, there will be a continuing smaller and to some extent more



Specialized supply mission to be performed at the Staging Areas or through them during the operating phase. The various primary and secondary industrial facilities and the resident facilities will have a continuing need for supply support. For the most part, State-level planning will have arranged for deliveries and product shipments for the primary industrial and business facilities and most of the secondary operations. Nonetheless, this planning should be checked to establish that it is adequate.

More importantly, the planning team will have added additional risk area operations (water and sewage disposal and some resident facilities, for example) and risk area support contingents that will generate supply requirements. For example, food distribution plans may be focused almost entirely on getting food to the host counties. Needs must be defined and arrangements made to continue food supply to resident facilities and Staging Areas. Supply needs of water treatment and sewage disposal plants and fuel requirements for risk area based refuelling must be estimated and arranged for. In addition, most operating sites are normally dependent on various local or regional suppliers of replacement parts and service. Most, if not all, of these normal sources will be closed down upon relocation.

Organizations engaged in risk area operations and support should be advised to contact the Resource and Supply Service contingent at their Staging Area for the sort of support they would normally obtain from other sources. Preplanning of likely staff must be expected to respond to urgent or impending needs, to know where materials and equipment are likely to be found in the risk area, and to be prepared to call on Statewide resources when necessary through the civil defense communications channels.

### Concluding Steps

The results of the planning described in this section should be summarized and documented by the planning team so that the essentials can be included in the appropriate parts of the risk area operational plan. It is highly desirable to present the recommended arrangements for risk area support to the local authorities at this time. Since the remaining elements of risk area planning involve the preparation of the operational plan and supporting emergency information materials, a complete review of the concept of operations, host area support, movement plans, and risk area operations and support is recommended.

New and modified organizational assignments derived from consideration of risk area support should be prepared and departure schedules adjusted as appropriate. It should be noted that it may be desirable and even necessary to provide assigned lodgings in the host counties to organizations who will support the movement phase and then relocate, so that they will not feel that their well-being and

that of their dependents may be jeopardized by being among the last to leave the risk area.

## 8. PLANNING THE MOVEMENT OF EQUIPMENT AND SUPPLIES

Meeting the minimum augmentation needs of the host counties almost certainly will require the movement of specialized equipment and supplies from the risk area. Among the more essential items are garbage trucks, earthmoving machines, medical equipment and supplies, radiological monitoring instruments and shelter sanitary and medical kits, as well as sundry items identified in the Requirements Statements as likely to be in critical short supply in the host counties. From the discussion in Section 3, it can be seen that, for the most part, equipment and supplies should be scheduled for movement after the relocation of the population has been accomplished. Indeed, in most cases, there is no reason why this essential activity should not continue beyond the three-day goal for relocation of the population.

As a corollary, a basic planning requirement is to assure all personnel involved in the relocation of equipment and supplies that their families have been taken care of, just as is planned for essential workers in critical risk area facilities. Thus, as a general rule, affected organizations and individuals should be relocated with their dependents, allowed to rest and get settled in the host county and then be transported back to the risk area for the movement of the equipment and supplies. Note that this approach differs from the commuting of essential risk area workers in that the returning personnel come from all host counties and not just the close-in hosting area. On the other hand, the essential activity is of short duration compared with maintaining risk area operations and the numbers of people involved are much smaller.

### Operative-Driven Equipment

Truck-type equipment, such as garbage trucks, dump trucks, fire engines, and supply-hauling tractor-trailers, are most likely to be driven to the host counties by the drivers that normally operate them. These trucks must move to the host counties either near the completion of relocation movement or during the slack early morning hours. As noted before, drivers will be motivated to take care of their families unless this has already been done. Thus, these households must be relocated earlier or must accompany the equipment in other vehicles. If two or more automobile operators are in the household, having the truck driver take his family and possessions in the family car to the truck and hence the two vehicles to the host county is feasible. Alternatively, buses can be provided for dependents that would accompany the truck convoy. Otherwise, drivers and dependents can be scheduled to relocate during the general movement, with the drivers returning for the trucks. If public transportation for those without private automobiles is to consist of multiple

trips, much of the return requirement can be accommodated on dead-heading buses (or passenger trains) initially delivering people to the various host counties may be scheduled to return to the nearby hosting area to participate in the commuting of workers to the risk area. And, of course, some of the buses can be scheduled for the return of the drivers.

### Transported Equipment

Some essential equipment, such as earthmoving machinery, is not suitable for self-movement on the highways. It must be transported to the host counties by flat-bed truck or by rail. In either case, the equipment usually can be loaded onto the flat-bed trailers or flat cars at the beginning of the relocation movement by the equipment operators, who can then relocate with their dependents to their assigned housing early in organization relocation to await the arrival of their equipment. Rail personnel and operators of the flat-bed equipment must be treated, of course, as discussed in the previous subsection. It should be noted that if rail movement is feasible and the proper rolling stock is available, trucks and other roadworthy equipment can be moved by rail rather than be driven to the host counties.

In Colorado Springs-El Paso County, for example, both options were found to be worthy of consideration. All host counties except Gunnison County have rail freight service on the Denver and Rio Grande Western railroad. Ample rolling stock is in the vicinity or can be assured by the State. Alternatively, there are 170 flat-bed trucks suitable for carrying the equipment registered in the county. Typical equipment inventories are: front-end loaders-125, backhoes-72, bulldozers-36, dump trucks-229. Gunnison County would need to be serviced by highway, but choices exist for the movement of equipment--and supplies--to the other counties. A reasonable plan would probably include both modes of transport and be aimed at minimizing hauling by highway.

One scheduling complication may occur with respect to the relocation of earthmoving machinery. The planning for risk area operations may develop a requirement for the construction of expedient last-resistant shelters at critical facilities for the on-shift work force. Trenching machines and backhoes are the primary equipment needed for this work. Some bulldozers are also needed for covering the trench shelters. If not accomplished during the crisis prior to directed relocation, which cannot be assumed in advance, the construction of in-place protection for risk area workers should be planned for accomplishment during the relocation movement, with equipment operators and their dependents scheduled for relocation when the task is complete. The effort estimates from Section 9

and equivalent shelter data for risk area support personnel should be used to estimate when the task will be accomplished and the personnel can be scheduled to depart. Front-end loaders and bulldozers mainly useful for upgrading fallout shelter can be relocated as discussed above. If trenching equipment is required to build expedient shelter in the host counties according to the Requirements Statements, this equipment should be scheduled for relocation to the host counties after the risk area shelters have been built.

### Movement of Supplies

Only the movement of essential portable equipment and supplies identified in the Requirements Statements should be planned for, with the possible exception of RADEF and other civil defense equipment that the host jurisdictions may have presumed were being planned for by the risk area organization. For example, it is true that substantial supplies of food and other essentials will remain in supermarkets and other retail outlets but supplies of these items can be directed to the host counties more efficiently from wholesale and processor levels as called for in the State plan. The State plan specified arrangements for providing all essential supplies and services during crisis relocation. Facilities involved in distribution of essential supplies and services are specified in the Phase I planning report based on the State planning done. Thus, only supplies specified in the host county Requirements Statements and those nominated by the risk area emergency coordinators must be planned for movement.

The host area support summaries prepared after the planning discussed in earlier sections should be consulted for the listing of supplies and their normal locations in the risk area. In some cases a number of locations, such as hospitals and clinics, will have to be visited to load all supplies of one type; medical supplies and equipment, for example. Local government trucks may be earmarked for this purpose. Alternatively, large intercity mail trucks operated by or under contract to the Postal Service may also be considered. In the private sector, van companies normally engaged in the movement of household goods can be expected to be available during the relocation period. Those not already earmarked to augment the distribution of food and other essentials (identified in Phase I planning) can be considered for the movement of these supplies.

In any case, not only truck drivers but also the laborers needed to load and unload the trucks must be identified by organization and relocation arrangements made for both workers and dependents as noted above. Generally, supplies should be planned for loading on the trucks during the first day or so of the movement phase, to be moved to the host counties near the end of the movement phase. All organi-

zations and workers identified for supply movement should be covered by organizational assignment forms and a planned schedule of supply loading and movement appended.

One category of essential supplies that should not be overlooked in this planning is that of RADEF instrument kits. In many risk areas these kits are in the hands of local operating departments and are stocked in identified fallout shelters. In others, the kits have been retrieved in the course of routine maintenance and stored in central locations for distribution in an emergency. The local civil defense coordinators should be consulted on the numbers and locations of the inventory. Those needed at critical facilities, staging areas, and other risk area support locations should be summarized and those in excess planned for movement to the host counties in proportion to the numbers of relocatees assigned or in accordance with the needs expressed in the Requirements Statements, if included therein. If most of the excess kits are in shelter facilities not needed after relocation of the population, they can often be retrieved along with shelter sanitation and medical kits, which usually will be included in host area requirements. Local authorities should be reminded, if necessary, that the well-being and survival of their resident population in the host counties is their responsibility; hence, they should feel no inhibition toward providing civil defense supplies and equipment to the extent that could be done were relocation not to be directed. In many cases, risk area civil defense offices will be more knowledgeable about what is needed than are those in the host counties. (This observation may apply even more forcefully to the relocation of trained monitors and radiological defense officers.)

In planning the movement of specialized supplies, the planning team is likely to encounter a typical difficulty. Supplies may require loading at several source locations and also be destined for several host counties. Either mixed supplies for a single host county must be loaded onto the same truck or a truckload of supplies of the same kind must be distributed over an area of several counties. Rarely will it be found that the needs of a particular host county for one type will constitute a truckload. The truckers to be involved in the movement should be consulted on the preferred procedure and emergency bills of lading drafted as part of the movement planning. Attention to such details will minimize confusion during the crisis situation. If not accomplished, the lack should be identified in the emergency checklist (Section 10) for correction at an early crisis stage.

#### Adjustment of the Movement Plan

The results of planning for the movement of equipment and supplies should be summarized by the planning team and used to up-

date and extend the movement plan previously developed. The planned movement of equipment and supplies should be added to the movement of people. Unless a large number of people are involved, further modification of the basic allocation is probably not warranted. All planning materials should be filed so as to be available for use in preparing the crisis relocation plan (Section 10) and developing crisis information materials (Section 11).

## 9. PLANNING RISK AREA OPERATIONS

Activities carried on in the risk area during the relocation period are of two kinds: (1) risk area operations, and (2) risk area support. Risk area support consists of mainly governmental activities to aid the orderly exodus from the risk area, and to maintain civil defense readiness in event the crisis should culminate in a nuclear attack. The planning of risk area support is described in Section 8 of this guidance.

Risk area operations are essential activities that must be undertaken at fixed facilities in the risk area during the relocation period. These operations may be classed into three categories for planning purposes. The first category consists of those activities carried on at Industrial and business facilities -- food processing and distribution facilities, defense plants, refineries, bank computer sites, and the like. These operations might be regarded as the primary operations. The second category consists of those activities carried on at residential facilities -- hospitals, correctional institutions, and other special-care facilities having inmates or patients that cannot be moved or are not planned to be moved to the host areas. The third category of risk area operations consists of service activities -- electric power, gas, water, and sewage disposal. These activities are usually carried on in what would be regarded as industrial facilities but, for the most part, they are needed to enable the other risk area operations to continue. Therefore, they might be regarded as secondary operations.

### Concept of Operations

The basic concept of continued risk area operations is that the minimum activities necessary or appropriate to the crisis situation will be maintained by commuting the essential work force from nearby host areas where the workers will be housed, fed, and sheltered with their families while off-duty. This policy is intended to keep the numbers of people in the risk area at any one time to a minimum during an intense crisis. The policy may be relaxed by the State or higher authorities under some crisis circumstances to permit essential workers (and, perhaps, their dependents) to remain in the risk area during off-duty hours, possibly in their own residences. The basic plan, however, will assume that all risk area workers return to the host area at the completion of the work shift. To further minimize the numbers of people in the risk area and to ease commuting requirements, facilities in the risk area will be operated on a two-shift basis, each of 12 hours duration for round-the-clock operations.



Arrangements must be made to provide blast-resistant shelter and emergency evacuation measures for the on-duty workers, should the crisis escalate to an attack situation. Organizations engaged in risk area operations will be expected to provide personnel for civil defense assignments at the work site in addition to those required for essential operations.

Risk area operations and support will be controlled from the central city Emergency Operations Center in urbanized areas and the risk county EOC in other risk areas. Two kinds of support facilities will be established in the risk area. The first are Staging Areas located in the vicinity of clusters of operating facilities. Staging Areas will provide on-shift feeding, emergency medical care, vehicle refueling, emergency repair capabilities, and generalized support to risk area operations. The Staging Area direction and control unit will function as a subordinate command center to the main EOC and serve as Shelter Complex Headquarters in event of attack warning.

The second set of support facilities will be Access Control Points located on principal highways at the edge of the risk area. These control points will limit access to the risk area to authorized traffic, provide route guidance and vehicle parking to trucks delivering to risk-area facilities and outbound to the host areas, provide a base for public safety forces in addition to the staging areas, and clear inbound traffic from the roads in event of attack warning. Control Points will also be subordinate command centers for direction and control under the EOC.

Risk area operations can be categorized as uninterruptible or interruptible. Operations at resident facilities and secondary operations (services) are uninterruptible. Primary operations are interruptible except where shutdown is time-consuming, dangerous, or costly. Thus, food distribution and banking activities are interruptible. Oil refining and steel production are not interruptible because of shut-down times and costs. In the case of interruptible operations, the general procedure will be to shut down operations during the mobilization period or upon the Governor's announcement directing relocation, to complete preparations on the part of employees and management to relocate, and to relocate during the assigned period of time after the Governor's announcement. The first shift to resume operations would commute back to the risk area after the exodus was essentially complete; generally on the third or fourth day after relocation was directed. This procedure avoids complicating the relocation movement by unnecessary risk area traffic to maintain operations, by truck traffic making deliveries, and by simultaneous commuting traffic from the host areas.

Uninterruptible operations are maintained initially by the commuting of essential employees from their place or residence. Other employees and their dependents prepare for relocation during the assigned period. Adjustment to emergency shift schedules are made at this time. Nonessential employees and dependents relocate during the assigned period. The shift on duty during the assigned period will relocate with their dependents after completion of the shift, rest in the host area, and commute to relieve the second shift, which then returns home and prepares to relocate. Depending on the timing of the directed relocation, the second shift may arrive at the relocation headquarters up to a day after the nonessential employees have relocated. This procedure also minimizes conflict with the main exodus.

### Defining Operating Areas

As a first step, the planning team should review the Phase I planning information (item 1 of the data package) on risk area facilities planned to continue to operate during the relocation period. Most primary operations and some secondary operations (electric power generation and gas distribution) were specified in the State plan and Phase I planning report in the form of specific facilities or organizations that would need to continue operations. Some primary operations may have been identified by the Phase I planners as having undesirable shutdown consequences although the facilities were not specified as essential by the State plan. Operations in these facilities are to be maintained at a minimum standby level. Finally, local services, mainly water supply and sewage disposal, would have been included by the Phase I planners.

The list of facilities and organizations involved in risk area operations (not risk area support) should be reviewed with local authorities to ascertain whether any major changes have occurred since the Phase I planning was accomplished. Should changes be suggested at the local level that would affect the activities specified in the State plan, these should be cleared by the cognizant State agency.

Next, the location of each facility should be marked on a suitable map of the risk area. Such a map may already have been marked up in the Phase I planning report. Because of usual land-use patterns, facilities should tend to cluster into heavy-industrial, light-industrial, and downtown areas. Exceptions may be the residential facilities included in the list of vital facilities, if any. The manner in which the facilities were grouped into operating areas during Phase I planning should be reviewed as well as the sites chosen as Staging Areas at that time. In general, the maximum dimension of an operating area or cluster of

essential facilities should be two to three miles and the Staging Area should be centrally located so that it is within a half hour's walking distance of any facility it serves. Exceptions can be made for isolated facilities, which should be assigned or attached to the nearest convenient Staging Area.

The purpose of this preparatory work is to lay an adequate basis for discussions with the management of these organizations leading to an estimate of the numbers of workers per shift that may be expected to be in the risk area, problems involved in modifying operations and adjusting work shifts, and any special conditions that might affect the scheduling of relocation time for the organization. Before such consultation, however, preparations should be made to consider protective arrangements for the workers at the same conference.

#### Protecting the Risk Area Workers

Returning some workers to the risk area to conduct essential operations foregoes, for them, the protection afforded by crisis relocation. Therefore, these workers should be provided protection, if not as good as those given in the host areas, then the best that can be done.

Two kinds of protection can be given those in an area at risk from direct weapons effects: tactical evacuation and all-effects shelter. Tactical evacuation is a quick-reacting, relatively short-distance movement to the edge of the risk area or beyond in response to attack warning. All-effects shelter offers a substantial degree of protection in-place against direct weapons effects -- blast, heat, and initial radiation -- as well as fallout. Tactical evacuation and all-effects shelter are not alternatives. Ideally, they are options to be exercised when the need arises. Tactical evacuation is not always a feasible option but all-effects shelter is almost always practical.

Given the types of intercontinental missiles an enemy might use, 20 minutes is a reasonable planning basis for expected warning time. In tactical evacuation, five minutes of this time should be reserved for the workers to shut down operating machinery and get into waiting vehicles. Another five minutes is likely to be required for the vehicles to exit the plant and get to a high -speed escape route. Thus, in the typical case, about 10 minutes would remain, during which about 10 miles could be made good. In general, tactical evacuation is practical if the operating area is 10 miles or less from the risk area boundary. The planning team should evaluate the evacuation option for each operating area or essential facility, taking into account any special circumstances that may occur in the risk area. Where evacuation appears feasible, escape routes should be identified and recorded.

The critical feature of tactical evacuation is the necessity for quick reaction. This means that transportation for the workers must be available close to or at the work place. If buses are to be used for the commuting of workers, they must remain with the workers, ready in case of need. Buses bringing in a work shift cannot be used to take the other shift back to the host area. Approximately twice as many buses are thus required. Car-pooling vehicles naturally stay with the workers and may become the preferred commuting method if evacuation is planned for. The planning of commuting arrangements is a support function covered in Section 3.

Successful tactical evacuation may put the work force beyond the reach of direct weapons effects of consequence but fallout may remain a threat. If escape routes happen to be in the commuting direction, workers can continue to their assigned shelters where they are hosted. If the escape routes are in other directions, the availability of fallout shelter in the escape direction must be investigated. This is also covered in Section 4 since the number of workers likely to need shelter must first be estimated.

All-effects shelter may be found in existing structures or may be provided by construction of trench-type expedient shelters during the early stages of a crisis relocation. The degree of protection afforded by existing structures is highly variable. Many do not offer any significant protection. The planning team should establish whether an all-effects shelter survey has been performed by DCPA in the risk areas and whether results are available for the facilities of interest. If not, a qualified shelter analyst should be included in the team visiting the sites of risk area operations. All-effects protection may have been considered by the Phase I planning team in some circumstances. For example, in the Tucson pilot project area, it was found that one of the five hospitals offered all-effects shelter for a sizable number of people. It was suggested that nontransportable patients (mainly those in ICUs and CCUs) be consolidated where protection could be provided, the other hospitals being shut down, with patients either discharged or relocated to suitable host area facilities. Alternatively, a hospital near the edge of the risk area might have been chosen as the resident facility. If such considerations are not evident, the planning team may wish to consider some modifications of prior planning.

One objective to be accomplished during site visits should be to assess the in-place protection available at each site or nearby and to estimate the amount of upgrading or expedient shelter construction that would be needed to provide reasonable protection to the work force. The information contained in items 5 and 6 of the data package will be useful for this purpose.

### Site Visits

With the foregoing preparation, the team should schedule a planning visit to each operating site. The local civil defense coordinator and other appropriate local government officials should be encouraged to attend. The Phase I planning report should provide guidance on the contacts made on earlier visits. If a substantial number of organizations must be visited, the planning team may be able to divide the load among the various individuals available. If this should appear necessary, it is recommended that all members attend one or two sessions to obtain a common orientation. If only one person qualified to evaluate in-place shelter is available, this activity can be scheduled separately, generally as a follow-up to the planning meeting.

It is suggested that the initial part of the conference be devoted to reviewing the earlier planning and to outlining the general scheme of risk area operations, drawing of the material in Sections 3 and 7 as necessary. Some of the work discussed in those sections may indeed have been brought to partial completion by the planning team. The essence of Part V planning by the organization can be discussed at this time. The nature of the Part V planning guidance and the input information that will be provided at the conclusion of Part IV planning should be summarized.

The first substantive information to be obtained is an estimate of the number of shift workers required to perform the contemplated risk area operations. This information is needed to plan for shelter protection at the work site, to plan transportation for commuting, to estimate cross-traffic that may be generated during the exodus by the work force needed for uninterruptible functions, and to help estimate the support requirements at Staging Areas and Control Points. The management should be encouraged to arrive at a reasonable minimum estimate of manning requirements consistent with the variable nature of crisis requirements. Certain management policies should be discussed at this point as appropriate. For instance, functions not tied to the fixed facility, such as clerical, timekeeping, employee services, and the like, should be suspended or accomplished at the relocation headquarters. Construction, maintenance, and repair activities should be relocated to the host area to be on call in event of need. If time delays for this arrangement are considered excessive, consideration should be given to locating such support at a Control Point. Services can also be expected from the Staging Area as well. If potential needs can be expressed, they should be noted for consideration in planning risk area support. A desirable technique is to "skeletonize" the existing organization, thereby retaining traditional, previously established lines of authority and supervision. If the organization is not normally on a round-the-clock or shift basis of operation, the advantages of spreading workload to minimize the numbers of people on-site at one time should be thoroughly reviewed.

The operating management will have in mind positions and functions to be performed. This will, of course, be essential to crisis operations. The planning team's needs are limited to recording a best estimate of the numbers of workers per shift. If uncertainties exist, it is better to have an estimate a little on the high side than on the low if support is to be fully adequate. To the number of shift workers, including supervisors, should be added two more persons per 100 or fraction thereof to be dedicated to civil defense duties -- shelter management, RADEF monitoring, warning, and the like. These additional persons should be assigned from management or the plant safety organization, if such exists.

The nature of the risk area operations should be summarized by the operating management. Anticipated changes in normal services should be recorded. If the establishment will require rail or truck service for raw materials or other inputs beyond on-site inventories or will be shipping products out of the risk area, the number of loads per day should be noted for use in traffic planning and for reference to State plans. Information will also be required on any supplies essential to the continued operation of the industry being interviewed. It will then be necessary to assure that the supplier will continue in operation.

Protection to be provided to the work force at the operating site should also be discussed. If tactical evacuation appears feasible, escape routes, destinations, and timing should be discussed. The relationship of an evacuation capability to commuting modes should be noted; that is, if sufficient buses are found not to be available, car-pools will be necessary. In facilities requiring a very limited work force, car-pooling is probably the preferred mode in any event and the preferences of the organization should be noted. The need for in-place protection of the work shift should be emphasized. If not already done or done at the time, arrangements should be made for a later survey of site buildings and other facilities. Availability of land on the site or nearby where expedient shelters can be dug should be established. Organizational equipment that might be made available to help construct or upgrade all-effects shelter should be identified as appropriate.

### Documentation

The results of visits to risk areas operations' sites should be recorded by team members as they occur and ultimately summarized for use in movement and support planning and in preparation of the risk area operations plan and supporting information materials.

## 10. PREPARING THE OPERATIONAL PLANS

With the foregoing planning elements completed, the preparation of the written Crisis Relocation Plans for the risk and host areas can be undertaken and substantially completed. Some of the emergency public information arrangements discussed in the following section must be included in these plans, but is useful to draw together most of the elements of these plans prior to considering the needs of the general public, as the effort will provide a good base for developing an effective information strategy.

In preparing these operational plans, the planning team should keep in mind one special characteristic of NCP plans. The risk of a nuclear war is considered low; indeed, good relocation plans are an important element in the deterrence posture that keeps the risk low. An intense international crisis in which relocation would be considered seriously is more likely than nuclear war but nonetheless unlikely. Hence, it is a characteristic of nuclear civil preparedness planning that those local officials, both elected and appointed who have participated in the preparation of the plans are not necessarily or even usually expected to be present if and when the plans may require execution. For this reason, the written operational plan is usually important. It must be explicit, well organized, and easily understood because the most likely circumstance is that those government officials responsible for civil preparedness at the time of need will be confronted with the problem and the plan for the first time. Since an international crisis of some severity and duration is likely to precede the need for action, there will usually be time for these key officials to become familiar with the content of the emergency plan. Nonetheless, a clear and readable plan is of the utmost value. It is the true legacy of the planning effort.

Annotated prototype plans for both risk and host areas have been prepared, references 15 and 16, for the guidance of the planning team and for use in discussions with local officials. The prototypes are based on risk and host areas in the States of Colorado, however, they are not the official crisis relocation plans for those communities. Rather, they are "school solutions" designed to exhibit typical situations and approaches to plan development.

These prototype plans include numerous references to relocation by organization groups. This element of crisis relocation planning is currently planned for the third and final phase of the CRP program. Therefore, in most of the initial crisis relocation plans, the detailed planning necessary for organizational relocation will not have been accomplished at this time and therefore will not be included.

Thus the actual plans provided must reflect the needs of the particular area based upon the planning discussed in previous sections of this guidance. If there are existing Emergency Operations Plans in these communities their arrangement and format should be considered equally with that of the prototypes, as it is desirable to avoid conflicting or incompatible emergency plans.

It should be noted, however, that existing plans for in-place protection can be developed individually for each jurisdiction with only minimum needs for coordination among the various plans. Crisis relocation plans must be integrated to a far greater extent. The prototypes represents the most recent advances in the coordination of plans. The prototype plans should be used in conjunction with this guidance, as the discussion in this section is intentionally abbreviated.

Crisis relocation plans must be prepared for each level of government, however, this guidance is oriented toward the production of County level plans. This reflects again the broad scope of CRP and the degree of interaction required between the various levels of government. While each city will have to prepare a crisis relocation plan, it is desirable to have the County plan encompass all of the operations within the County boundaries including those of the constituent cities. Depending upon local conditions, it may be desirable to have a combined City-County plan. This would be necessary where there is a large central city in the county and the city resources are more extensive than the counties. This is similar to the approach taken on countywide transportation plans or on County General Plans where even though the County's jurisdiction is limited to the unincorporated areas the urban systems being planned for generally extend beyond local jurisdictional boundaries.

While the discussion of the crisis relocation plans refer to host plans and risk plans, there will be many cases where the County contains both host and risk areas. In this case, only a single plan is required, however, it will cover both risk and host operations.

## CONTENTS OF THE PLAN

The Crisis Relocation Plan should consist of a Basic Plan and Annexes. Both the Basic Plan and Annexes may have a number of Appendices, some of which may be separate from the plan document because of size or for convenience in updating. In some States, the Crisis Relocation Plan may be an Annex to an overall emergency plan; in which case, some of the general elements of the Basic Plan and Annexes will be in the overall plan and the Annexes become Appendices to the Crisis Relocation Annex. What would otherwise be Appendices would become Tabs or some other designator consistent with State practice. In this section, the format of the prototype is used for illustrative purposes.



## The Basic Plan

The format for the basic plan generally follows current DCPA guidance in Part G of the Federal Civil Defense Guide. The initial paragraph cites the authority for existence and implementation of the plan. This is typically an unnumbered paragraph. Next come the situation and assumptions. The first two statements set the national and international scope of the situation and should be adopted directly.

### Situation and Assumptions

The next few situation statements define the Statewide context and must be consistent with the State Crisis Relocation Plan. The remaining situation statements pertain to risk or host area and therefore must reflect the situation of the area as appropriate. There are fourteen (risk) and twelve (host) assumptions in the prototype plans, most of which can be readily adapted to the particular area.

One feature of the risk area prototype is that the entire county is included in the plan, not merely the risk area. Since risk area boundaries rarely follow jurisdictional boundaries, this will often be the case. Hence, elements of the plan have to do with the hosting of part of the risk area population in the nonrisk parts of the metropolitan county. Otherwise, the assumptions are consistent with the policy and planning considerations discussed in the overview document (CPG-2-8-A).

### Mission

The second numbered paragraph in the basic plan is the mission statement. The statement in the prototype plan is recommended for use but particularized to the appropriate area and county names.

### Execution

Section III of the Basic Plan is entitled "Execution." It is the most important section of the plan as it lays out the concept of operations, the emergency organization, and the support arrangements.

The concept of operations - is a critical element for the planning team to develop with local participation and review. If the review session suggested in the guidance has been held, a good basis for the concept will have been established. As noted before, many of the local officials who have participated in or audited the planning may have been replaced at the time the plan may become relevant. Hence, the concept of operations should communicate

the essence of the planned arrangements to those who may be addressing the matter of crisis relocation for the first time. Presumably this attention will come about at an early stage of a crisis. Nevertheless, there will not be a great deal of time to educate those who will be involved through coordination meetings and training sessions.

The prototype concept of operations should be compared with the planning already accomplished and used as a model for outlining the operational arrangements pertinent in that county. The initial paragraph of the concept of operations defines the three important operating time periods: the Preparatory Period, the Relocation Period, and the Attack Period. Then, the description introduces the reader to the existence of action checklists in the Annexes, which represent another important tool for rapid familiarization of key officials with the operational plan.

Actions during the Relocation Period are of such importance that they should be summarized in the concept of operation along the lines suggested in the prototype plan. It is best to refer the reader to the Appendices to the Basic Plan in the course of the description of operations. These are, at a minimum, a plan of the risk area showing its boundaries, a listing of host area particulars, a listing of organizations having either risk or host area operational assignments, a designation of relocation routes, the location of operating areas, Staging Areas, and Access Control Points, and a listing of key personnel.

The emergency organization - paragraphs perform the essential task of assigning crisis relocation functions to appropriate governmental and private agencies. The five-service approach of the prototype plan is recommended. The services are not regarded as new organizations, but rather as functional areas or groupings designed to ease coordination. This is especially important in the Crisis Relocation Plan because capabilities will come not only from within just the host or risk county but from both areas and also the State. As a part of the coordinated service activities, each existing organization or organizational element that will participate can have "its plan" as an Appendix to the Service Annex. Thus, coordination can be achieved among various jurisdictions and among government and private organizations without disturbing existing organizational structures and their group ties and spirit. The mission statement and a listing of all participating organizations for Direction and Control and the five coordinative Services should be included in the Basic Plan. The detailed statement of functions required to carry out the mission should be placed in the Annexes to avoid bogging down the basic plan with unnecessary detail.

The support paragraphs - should summarize arrangements that have been developed in State crisis relocation planning. The

statements in the prototype plan cover the minimum likely to be pertinent. The planning team should consider whether these statements are adequate and expand or add to them as necessary. They are quite important in informing participants on the situation within which they will be operating.

### Administration and Logistics

The fourth numbered section in the Basic Plan, "Administration and Logistics," should outline the basic arrangements that are common to all Services. Referring the reader of the plan to various annexes and appendices for a statement of these arrangements is not recommended. The topics covered in the prototype plan may not cover fully the arrangements that should be identified in a particular plan.

### Direction and Control

The fifth and last section of the Basic Plan, "Direction and Control," should specify the conditions under which the plan will be implemented, identify the executive line of succession by office held, and designate the location of the Emergency Operating Center for direction and control. Names of responsible officials, such as the executive and Service Coordinators, should be placed in an appendix to the Basic Plan. It can be a separate document that can be readily updated as personnel changes occur.

### Annexes to the Basic Plan

A minimum of six Annexes are required to support the Basic Plan, one for Direction and Control and one for each of the five Services. If the five-service organization is not adopted, additional annexes will be required to fit the organization chosen. The Direction and Control Annex is a rather specialized annex containing the detailed organization and procedures for this functional area. The five Service Annexes tend to follow a common pattern.

The first three sections of all Annexes are similar in nature. Section I should restate the mission from the Basic Plan and should specify the functions to be performed in the Preparatory, Relocation, and Attack Periods. Section II should list or otherwise define the planned participation in accomplishing the functions. In the Services Annexes, participation is usually by organization or organizational element. Section III contains a set of statements defining the operational situation, some of which are condensations of those appearing in the Basic Plan. This repetition is recommended to make the annex more self-contained. It will be noted that some of the

statements in the prototype plan refer to an action checklist. References 17 and 18 contain prototype generalized checklists as an aid in developing Appendix 1 to Annex A. The Service checklists are developed from the master checklist and assign responsibility to appropriate participating organizations. The final situation statement in the prototype annexes should specify shift arrangements.

Section IV of the Direction and Control Annex, which is the last section of this annex, defines the control responsibilities, the responsibilities of the liaison teams assigned to the host counties, and the assignments for internal operations of the EOC. Details are placed in Appendices to the Annex. Most of these appendices are very important to emergency operations and deserve considerable effort in their development. A common failing of many emergency operations plans is that these essential procedural arrangements never get put down on paper. Unless these appendices are well developed in the existing in-place plans and can be readily adapted, active participation by appropriate risk area agencies should be sought to develop these appendices to an operational state.

Table 10-1 provides a synopsis of the content of a typical Service Annex. The examples in the prototype plan expand on this synopsis. The Law Enforcement and Fire and Rescue Annexes can and should be developed by the public safety agencies based on the planning described in previous sections of this guidance. The remaining Service Annexes are likely to require considerable work on the part of the planning team in coordination with various participating organizations. Most of the actual planning will have been accomplished earlier in the planning process; hence, the production of a Service Annex consists mainly of drawing together the results of this planning, affirming responsibilities, and organizing the information as suggested by the prototype plan.

In general, there should be one appendix to a Service Annex for each participating organization, which is "its plan" for crisis relocation operations. The Crisis Relocation Plan for a risk area cannot be regarded as complete until at least the appendices for all local government agencies have been prepared. The risk area governments must take the responsibility for seeing that this is done. The State and Federal governments have a similar responsibility with respect to their offices and facilities in the risk area. The preparation of the appendices for private industrial, business, and institutional organizations is likely to be a problem to be worked on over a longer period of time. CPG-2-8-D and CPG-2-8-E are designed to help these organizations prepare their plan, using the organizational assignment forms, reception and care personnel requirements, and departure schedules developed in this part of the

TABLE 10-1  
SYNOPSIS OF TYPICAL ANNEX

TITLE	(Should be functional rather than organizational)
MISSION AND FUNCTIONS	(As assigned in the basic plan plus a detailed listing of functions during the Preparatory, Relocation, and Attack Periods.)
PARTICIPATION	(Listing of the several organizations included in the Service and having a piece of the action.)
SITUATION	(The essential context for the mission assignment; include pertinent statements from the basic plan that are necessary to understand the operations so reader does not have to refer back to basic plan.)
RESPONSIBILITIES	(The partition of the mission assignment among the organizations listed in PARTICIPATION on the basis of geography, jurisdiction, function, task, or time period. Refer here and/or under PARTICIPATION to the Appendices to the Annex, which will include one for each participating organization.)
COORDINATION	(Cite here the arrangements for coordination among the participating organizations, including the naming of a Service Coordinator, reporting requirements, common communications, and interjurisdictional agreements.)
ACTION CHECKLIST	(A summary checklist of actions for the Preparatory, Relocation, and Attack periods for the functions appropriate to the mission statement, drawn from the Master Checklist--Appendix 1 to Annex A--with assignments to the appropriate participating organization.)
APPENDICES TO THE ANNEX	(There should be one appendix for each participating organization that details its responsibilities and assigns specific tasks and actions, specified deployments, operating locations, and schedules, and outlines procedures and SOPs. In addition, there may be appendices for specific functions that are of special nature or common to all participating organizations, such as communications, RADEF, rescue reporting, and the like.)

guide. The plan format is intentionally simple. Nonetheless, it can be anticipated that many private firms will be disinterested until an international crisis makes the planning suddenly relevant.

A common objection to peacetime planning of this type is that personnel turnover makes the planning obsolete very quickly. It is, of course, true that every relocation plan must be updated in these details during the early phases of a crisis. But much of the plan will be pertinent and planning bases, such as population distributions and approximately how many need transportation, are unlikely to change much even though old faces disappear and new ones appear.

## 11. EMERGENCY PUBLIC INFORMATION

Detailed information on preparing emergency public information (EPI) for crisis relocation is contained in CPG-2-8-F (Ref. 5). This section discusses the types of information required and the need for coordination among the various public information items prepared.

Standby emergency instructions for the general public were prepared during the Phase I Statewide planning. The content of these instructions and associated public information will be found in item 1 of the data package. Since this earlier information was developed before the detailed planning discussed in this document it will necessarily be rather general and lacking in detail. This final version of the EPI materials should be as complete and as credible to their intended recipients as possible.

The emergency instructions or guidance that are the subject of this section are those materials that would be disseminated by the mass media and through organization supervisory channels at or very near the time that crisis relocation is directed. Clearly, total reliance on such materials to motivate a high degree of cooperation and compliance on the part of the public would be foolhardy. Much groundwork should have been laid earlier in the crisis and in peacetime so that recipients of the instructions are not confronted by a totally new undigested idea. At the same time, laying the groundwork involves a somewhat novel problem for the government. The problem is implicit in contingency plans in general but has special aspects with respect to crisis relocation.

### The Problem of Contingency Plans

One of our civil defense contingency plans is based on in-place protection of the population. The instructions connected with this plan are basically simple--seek shelter when the Attack Warning sounds.

Since a war "out of the blue" is highly unlikely, there will generally be time to elaborate on where the shelters are and what to bring when the public and local authorities are made more attentive by a crisis. All this information is available in most localities right now for those who are interested. These preparations are good and must be continued, since we may one day have to make use of the in-place plan if crisis events move rapidly or if the President never finds relocation compatible with his attempts to ameliorate the crisis.

Thus, as crisis relocation planning progresses, the option of

crisis relocation must be presented both in peacetime and during a crisis as one that may be invoked in certain localities but only if the President so decides. This information is, of course, of primary interest to those risk areas for which the option is planned and the host areas that would be involved in reception and care. But, in many parts of the country, this is likely to include most everyone. Many people find it difficult to think about contingencies and alternate plans, especially when one of the alternatives is not a matter of personal or even local choice, but a matter of grave national decision. Thus, the communication of civil defense information becomes more complex and a matter to be handled both candidly and with great care. In particular, any attempts to down-play the possibility of crisis relocation or withhold information "until later" will jeopardize the laying of the groundwork without which emergency relocation instructions will be much less credible and persuasive to the citizenry.

In a real sense, the need to regard crisis relocation as a contingency plan that might not be implemented in a particular crisis situation causes the most difficulty in the risk areas. Indeed, the Host Area Survey and the shelter upgrading plans discussed in Section may resolve many shelter deficit problems and make many host county in-place protection plans more effective. On the other hand, most host county nuclear defense plans assume that normal or business-as-usual conditions will be maintained until it is necessary to take shelter. The influx of relocatees during a crisis will result in job dislocations and economic controls in the host county similar in kind to those anticipated after a nuclear attack. Thus, the preparation of crisis information materials for host county residents is likely to be as challenging as it will be in the risk areas.

#### Elements of the Public Information Plan

The public information plan encompasses a wide variety of material to be distributed through all of the media forms available. The material can be categorized by time from - early crisis, movement to host area standby, shelter, and return. It can also be categorized by host and risk area information or audiences. Each of these categories has separate but overlapping information needs. The media that will be used include radio, TV, newspaper, and direct distribution of printed material.

In order to assure that credible and effective instructions are provided it is necessary to examine this active spectrum of requirements and to tailor each element to its audience and the media to be used.



### Pre- and Early-Crisis Information

The type of information in this phase will be oriented to raising the public knowledge of the existence of NCP contingency plans and how they will be implemented. Generally it is helpful and necessary to have prepared materials based upon DCPA Fact Sheets and the type of material contained in CPG-2-8-F. However, with the increasing interest in civil defense that will occur as a crisis develops, the amount and type of information disseminated will be determined primarily by the news media itself. Initially their focus will probably be on weapon effects, probable threat to the area, and the status of civil preparedness plans. As the crisis intensifies, the emphasis will shift to specific preparedness activities recommended before, during, and after a nuclear attack to increase the chances of survival. Finally, the specifics of the CSP and CRP plans will be disseminated in the risk and host areas. Also, employers in essential operations, both private and governmental, will be providing specific information to their employees.

### Movement to Host Areas

This phase will commence with the issuance of specific directions regarding the order to relocate initiation of controls on traffic, financial transactions, operation of economy, distribution of resources, etc. These materials should all have been prepared in advance by the planning team, and/or State and local authorities. Within each area there will be two tiers of instructions. The overall instructions applying to the Nation or State and their specific instructions for each risk and host area.

Risk area - instructions will need to indicate who will be relocated, where to go, how to get there, and what to take. Experience has shown that the public has difficulty in understanding and retaining information and instructions gained from radio and TV. Printed instructions are the most reliable means of informing an individual of where he is to go in the host area based on where he lives in the risk area. Thus, a newspaper supplement or its equivalent will be necessary as the basic communication, with information passed through other means to be regarded as of a redundant, reinforcing character. A map of the risk area, partitioned into neighborhoods or areas each associated with a particular route and host destination, is the most common form of communication for the "where to go" information. A map is not ideal, as many people have difficulty reading a map. Other alternatives have been suggested, such as zip codes or the first three numbers or prefix of the telephone number.

To minimize the number of stay-puts, it has been suggested that telephone numbers be cited where households with special problems can appeal for assistance. If not already included in the risk area operational plan, means for satisfying this public information need should be explored by the planning team and included in the public information plan.

In addition to instructions to the general public, instructions to workers in essential industries or services will be disseminated through their organizations.

Host area - instructions should advise the residents population on how to prepare for the arrival of the evacuees and what will be necessary to support the people arriving from the risk area.

The residents of the host county should be informed of the status of relocation plans, designated movement routes, the alerting of emergency forces, and of any last-minute changes in the host county plan. Means for volunteering to host relocating families should be publicized. Principal county officials should issue statements and appear on news media to encourage cooperation and assure the public that plans are ready.

#### Standby

During the standby phase after relocation is completed, it will be necessary to expand the kinds of information provided to the news media to include the interests of both the relocated population and those individuals who chose to remain in the risk area.

They need information on arrangements for their care, health precautions, conditions in the risk area, and, of course, news and information on the crisis itself. Substantial effort should be given to the need for and techniques for upgrading shelter or constructing expedient shelters. Broadcast, newspaper and direct distribution of printed material should be used to convey information for this construction effort.

Following the completion of the movement phase, some unknown number of stay-puts can be expected. If this number is large, this fact should be evident in reports of traffic monitors. If it is quite small, the existence of stay-puts may only become apparent after several days of patrolling the vacated areas of the risk area. For public information planning, the existence of stay-puts should be assumed. Radio broadcasts aimed at stay-puts should be included in the public information plan. Such

Messages should be broadcast after the movement phase is essentially complete. Stay-puts should be encouraged to leave the risk area after the main exodus and offered assistance to do so. They need to be advised of the location of the Staging Areas and that medical aid, food, and other necessities are available there. (This information should not be disseminated during the movement phase as it could be misinterpreted by many who might otherwise leave.) Stay-puts also need to be advised of curfew and other control regulations and warned not to engage in criminal activities. Ultimately, they may need to be warned to seek shelter from attack.

As noted earlier, the relocated population will have a continuing concern for the safety of their vacated homes and possessions. Information transmitted to the host counties from the risk area EOC on conditions in the risk area can be invaluable. In addition, it is recommended that risk area news media be allowed to convey reporters and video camera teams to the risk area to provide independent risk area coverage.

Selection of a minimum number of information channels to and through the mass media is important in ensuring accurate and non-conflicting sources of information. Thus, the most appropriate of the existing communications media should be used to communicate with the public. Most host counties will have limited media sources available within them; many normally dependent on TV, radio, and newspapers from the risk area. Where local choices are available, the extent of cooperation, ease of access, and coverage of the host population should be considered in deciding emergency assignments.

Highly detailed and specific instructions should be provided in writing rather than verbally. Considerations should be given to the extensive use of bulletin boards in congregate care facilities and in public places in addition to handouts. Radio and television are most useful in reviewing and explaining the written word and for instructional purposes. Replication and redundancy of information and instructions will be essential to effective communications.

The substance of instructions and directives to the public must originate at an official government source. No news medium should be the originator or source of directives to the public without official government approval. The source should be the EOC, with direct communications with the State, which has overall responsibility for public information. This means that news releases and desired public information originated by the various participating agencies must be channeled through and approved by

one central and authoritative source at the EOC. Information collected by the media should be reviewed for accuracy insofar as possible and the media should be monitored. Rumor deflation procedures should be developed. Finally, all information should be as complete and realistic as possible, but should be presented in a manner to provide reassurance.

### Shelter

If attack warning is issued resident and relocated population will proceed to shelter that was assigned to them in the CSP or upon registration at the reception center. The primary source of information during this phase will be radio broadcasts providing situation reports and instructions on protection of the population. Emergency information packages developed in support of CSP's, when available should be reviewed to determine their applicability. However, for the most part, it is anticipated that this material will be generated during the shelter operations phase and will be dynamic type information rather than pre-package data.

### Return

As advice is received that a return of relocatees to the risk areas will be authorized shortly, the return schedule and other return planning should be publicized. Necessary steps to clean up congregate care facilities should be promoted. As the return progresses, those in the host county should be kept informed of the progress. Also, plans for defraying costs and reimbursing damages should be announced. Finally, guidance leading to a return to normalcy in the host county should be issued.

## APPENDIX A

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## APPENDIX B

### CHECKLISTS FOR HOST AND RISK AREA PLANNING

## CHECKLISTS FOR PERFORMING AND REVIEWING HOST AND RISK AREA PLANNING

### PURPOSE

These checklists are intended to assist State and Regional Planners in three ways:

1. To provide a device for indicating who is responsible for performing each of the crisis relocation planning activities.
2. To serve as a common reference to ensure that each of the crisis relocation planning elements has been covered in the documented crisis relocation plan.
3. To aid planners in performing an initial review of the crisis relocation plan and periodic reviews in the future.

THESE CHECKLISTS ARE INTENDED TO COMPLEMENT THE CRISIS RELOCATION PLANNING GUIDANCE, AND IN NO WAY SHOULD THEY BE CONSIDERED AS A SUBSTITUTE FOR THE MORE DETAILED GUIDANCE THAT PRECEDES THE CHECKLIST.

In the column labeled PLANNING RESPONSIBILITY enter the name and/or title of the person(s) responsible for performing each of the crisis relocation planning activities. This planning should include the preparation of statements/discussions on each of the planning elements.

In the column labeled PLAN REFERENCE enter the number and/or title of the section of the documented crisis relocation plan in which each planning element is contained (only where the item is actually covered in the plan).

### RELATIONSHIP TO NUCLEAR CIVIL PROTECTION (NCP) PLANNING

Crisis relocation is one of two options included in the Nuclear Civil Protection (NCP) plan -- the other option being protection of the population in-place, at or near their places of residence.

Since crisis relocation planning is really a part of the larger NCP plan, and Emergency Operations Plan, planners may wish to consider two alternatives in performing the crisis relocation planning:

1. Prepare a Basic Plan that is specifically related to the Crisis Relocation Plan, or
2. Use the same Basic Plan prepared for the more comprehensive Emergency Operations Plan, thus using the Basic Plan as an "umbrella" for all emergency planning.



Regardless of the alternative selected, some specific elements of a "typical" Basic Plan should also be included as part of the Crisis Relocation Plan. This is due to the fact that some planning requirements will vary from one type of emergency to another and there are different requirements for different strategies/options. For example, there are considerable differences between planning for crisis relocation and planning for in-place protection. Therefore, as a minimum, it is suggested that the following Basic Plan elements be repeated in more specific terms in the Crisis Relocation Plan:

- Situation and Assumption
- Concept of Operations
- Emergency Organization
- Direction and Control

Preferences regarding how the Crisis Relocation Plan is to be organized will most likely vary from State to State. Some planners may wish to organize the plan (e.g., annexes) by department or agency (i.e., police, fire, public works, etc.), while others may wish to organize the plan by function (i.e., communications, RADEF, shelter, etc.). Still others may prefer a cross-reference using both methods. The primary concern, regardless of how the documented plan is organized, is to ensure that all relevant planning elements (based on the guidance) are adequately covered in the plan. Those checklist items that are accompanied by an asterisk (\*) should be covered specifically in the documented emergency operations plan and are intended to facilitate the review of the plans.

## HOST PLAN CHECKLIST

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## III-A. POLICY AND PLANNING CONSIDERATIONS

## Planning objectives

To ensure that policies and planning relevant to crisis relocation are described in the documented Crisis Relocation Plan.

## CHECKLIST

	PLANNING RESPONSIBILITY	PLAN REFERENCE
*1. Indicate who is authorized and responsible for initiating crisis relocation. Also be certain to cite the basis of this authority (e.g., specific legislation).		
2. Indicate whether crisis relocation would be directed and compelled by, e.g., the Governor upon receipt of a request to do so from the President. If such provisions are the result of State legislation, be certain to cite the law.		
*3. Describe the hosting policies and constraints upon which the State's crisis relocation plan is based.		
*4. Specify the anticipated movement time and relocation duration involved. Also indicate the transportation modes planned to be used, i.e., the transportation policy and identify the number of relocatees to be accommodated in the host area.		
*5. Describe the essential support activities to be planned for. These should include such things as:		
<ul style="list-style-type: none"> <li>Those activities required to maintain essential services in support of the relocated population</li> </ul>		
<ul style="list-style-type: none"> <li>Those defense-related activities that may be required for support of urgent national security objectives, including mobilization</li> </ul>		

	PLANNING RESPONSIBILITY	PLAN REFERENCE
<p>6. Describe the relocation assignment principles, being certain to take into account the principles of:</p> <ul style="list-style-type: none"> <li>• Equal travel requirements</li> <li>• Use of host jurisdictions in a balanced fashion</li> <li>• Use of non-residential and residential structures</li> </ul>		
*7. Describe the policy on the utilization of State and Federal employees in the performance of emergency duties.		
*8. Describe the current economic policies of the government for dealing with problems associated with economic dislocations affecting both relocated families and host area families.		

## III-B. MAKING HOUSING AND FEEDING ARRANGEMENTS

## PLANNING OBJECTIVE

To identify hosting alternatives and to select a preferred scheme for housing and feeding the relocatees.

## CHECKLIST

	PLANNING RESPONSIBILITY	PLAN REFERENCE
1. Review the survey printout to identify omissions or other errors which may have occurred for one reason or another. Communicate these possible errors to the DCPA regional headquarters.		
2. Using the survey printout, perform a test to determine/confirm that there is sufficient congregate care housing in the host area to accommodate the number of relocatees assigned.		
3. Prepare a supplementary list of buildings, mines, and caves apparently omitted from the survey, using a format similar to that used on the congregate care printouts.		
4. Perform a preliminary selection of congregate care facilities to portray the geographical distribution of the housing potential. Be certain to:		
a. Identify from the survey printouts the facilities that seem most suitable for housing relocatees. Remember to nominate about 20 percent more than ostensibly required		
b. Indicate the section number of facilities on the survey printout		

	PLANNING RESPONSIBILITY	PLAN REFERENCE
c. Prepare a tally sheet containing the name of the facility, facility address, the use code, and the presumed congregate care capacity, according to the survey printout		
d. Total the capacity for each section and recapitulate (by section) on a master worksheet		
5. Compare the location of potential lodgings with the potential for feeding the relocatees in the same section or in a neighboring section.		
6. Visit each facility to be included in the host area crisis relocation plan for the housing and feeding of relocatees and residents and maintain a running count of verified facilities and spaces. Also:		
a. Develop inspection ground rules		
b. Check each facility for the existence of kitchen facilities for mass feeding		
c. Estimate the mass feeding capacity		
d. Monitor the inspection results each day		
e. Summarize and present feasible schemes to the county executive or board for review and selection of a preferred housing and feeding plan		
*f. Organize the selected scheme into a listing of the facilities selected to house the relocatees, together with the housing capacity associated with each and the mass feeding facility to be used by relocatees assigned to the facility		

		PLANNING RESPONSIBILITY	PLAN REFERENCE
	*g. Identify those facilities which could be used by special groups of evacuees with special needs or problems		
*7.	Organize all lodging and eating facilities into a manageable system in order to provide for the reception and care of residents and relocatees. Also:		
	a. Prepare a brief description of a "typical" Lodging Section		
	b. Assign at least one staff member (to each Lodging Office) who resides or works within the geographical area		
	c. Develop Reception/Care Districts		
	d. Combine Reception/Care Districts into Reception/Care Divisions		
	e. Develop worksheets for each of the Lodging Sections showing lodging facility, capacity, and feeding facility		
	f. Develop a list of staffing requirements		
	g. Identify location of registration centers.		



## III-C. PLANNING MOVEMENT CONTROL

## PLANNING OBJECTIVE

To plan for the movement of large numbers of vehicles through the county to other hosting areas; to aid those to be hosted in the county to reach their relocation headquarters or reception center; to control vehicle use within the county; to control commuting vehicles to and from the risk area; and to plan for an orderly return to relocatees to their homes, assuming that the crisis is resolved.

## CHECKLIST

	PLANNING RESPONSIBILITY	PLAN REFERENCE
*1. Identify alternative transportation routes for relocatees who are to be hosted within the county.		
*2. Analyze route capacities and select final routes which provide for balanced loading on highways and host areas.		
*3. Determine need for public transportation.		
*4. Develop public transportation operations plan.		
*5. Designate rest and staging areas. Be sure to consider parking facilities; toilet facilities; the use of rest areas as a reception center; the use of rest areas as locations for assigning unattached relocatees to reception centers; refueling capabilities; and suitability as staging areas.		
*6. Plan for vehicle parking, including the use of "vehicle parks." Consider the merits of normal parks, impoundment-type vehicle parks, and 24-hour guard service.		

	PLANNING RESPONSIBILITY	PLAN REFERENCE
7. Prepare a tally to reflect estimates for each Lodging Section for the number of peace officers required, the number of vehicle guards required, and the number of traffic monitors required.		
*8. Plan for handling vehicles (autos or buses) with mechanical problems, flat tires, out of gas, etc. Incorporate in the planning all service stations and repair facilities along the movement routes.		
*9. Plan for in-county transportation.		
*10. Identify existing camps and trailer parks and designate additional sites, as necessary.		
*11. Designate checkpoints near the county boundaries on the main highway routes for controlling movement to the risk area.		
*12. Plan for the return of relocatees to the risk area following the termination of the crisis period. This should include the preparation of a separate route plan and map for the return.		

## III-D. PLANNING FOR FALLOUT SHELTER

## PLANNING OBJECTIVE

To plan for fallout shelter of both host county residents and relocatees.

## CHECKLIST

	PLANNING RESPONSIBILITY	PLAN REFERENCE
1. In light of existing residential basement shelters, estimate the need for community shelters.		
2. Based on the survey printout and local knowledge, identify those facilities which could provide substantial shelter space, even though they do not offer substantial congregate care capacity. These facilities include mines, caves, tunnels, potato cellars, etc.		
3. Compare the locations of high-capacity fallout shelter space (mines, caves, etc.) with the location of the population to determine the feasibility of use.		
*4. Note the high-capacity fallout shelter spaces and allocate not only those who have been assigned to live in these facilities, but also people in the vicinity who are housed in facilities with a shelter deficit within them.		
5. Identify those shelter spaces potentially available through upgrading of parts of the congregate care facilities.		
6. Compare the number of people not yet assigned to shelter to the number of "UPGRADABLE" spaces shown in the summary at the end of the printout. Be sure to prepare a priority list of "upgradable" shelter spaces from greatest to least productive. Also consider alter-native if expedient shelter.		

	PLANNING RESPONSIBILITY	PLAN REFERENCE
7. Visit the proposed fallout shelter facilities to verify that the information on the survey printout is essentially correct and that the upgrading process is feasible in all cases.		
8. Review the upgrading/expedient shelter requirements with the host county engineer or highway agency to establish the equipment and manpower required to accomplish the necessary work over a three-day period.		
*9. Prepare a list of facilities required for upgrading.		
*10. Identify the need for materials, equipment, and manpower, if the construction of expedient shelter is also required.		
11. Compare the logistical requirements for shelter upgrading and construction to the capabilities available within the host county. Be sure to identify deficiencies for inclusion in the Requirements Statement.		

## III-E. PLANNING MEDICAL SUPPORT

## PLANNING OBJECTIVE

To plan for medical support for the "moving population" during the relocation and return periods; care for the current patient load, the chronically ill, and the aged; and health services for the "normal" population -- both residents and relocatees.

## CHECKLIST

	PLANNING RESPONSIBILITY	PLAN REFERENCE
*1. Prepare a plan indicating where rescue vehicles and ambulances should be stationed for coverage of main transit routes and relocatee feeder routes.		
2. Summarize capabilities for providing medical aid personnel, vehicles and equipment and compare with plan requirements. Be sure to record deficiencies and include in the Requirements Statement.		
3. Identify host area emergency room capabilities and relate to ambulance locations.		
4. Review assignments made in the housing plan as they pertain to medical patients and staff and make any necessary adjustments.		
5. Prepare an inventory of other medical facilities, such as clients, treatment capabilities in correctional institutions, and nursing and rest homes in order to identify remaining emergency capabilities.		
*6. Prepare lists of facilities (including pharmacies) that can accept patients of various types, offer outpatient services, and provide laboratory or other medical support.		

	PLANNING RESPONSIBILITY	PLAN REFERENCE
*7. Plan for the use of patients facilities or emergency housing in nursing homes and rest homes in a medically appropriate manner.		
8. Review (with medical and health professionals) the congregate care housing conditions that can be expected if all assigned risk area residents relocate as planned and if use of volunteered dwellings is negligible.		
*9. Prepare plans for medical surveillance and initial health care contact.		
10. Compare the numbers of medical and paramedical personnel required with those known to be available within the host county. Be sure to record deficiencies for inclusion in the Requirements Statements.		
*11. Plan for public health measures and the care of host county residents.		

## III-F. PLANNING PUBLIC SAFETY SUPPORT

## PLANNING OBJECTIVE

To plan for law enforcement and fire protection and control during the crisis relocation movement phase (both relocation and return), the standby or relocated phase, and the shelter phase.

## CHECKLIST

	PLANNING RESPONSIBILITY	PLAN REFERENCE
*1. Prepare plans for responding to vehicular accidents that may occur on the planned movement routes.		
2. Evaluate (with local fire agencies) the desirability of stationing fire personnel and equipment at the rest areas during the Movement Phase.		
*3. Plan for monitoring the flow of traffic during the Movement Phase. Be sure to determine the number of officers and vehicles required.		
4. Establish boundaries and staffing patterns for security patrols in each R/C Section area.		
5. Determine requirements for expanded detention facilities for relocated inmates from risk area and increased criminal incidents in host area.		
6. Prepare a worksheet providing details on law enforcement resources required and locations involved. These include: locations (such as for traffic monitors, traffic control points, etc.); regular personnel required (per shift); auxiliary personnel required (per shift); vehicles and equipment and supplies.		

	PLANNING RESPONSIBILITY	PLAN REFERENCE
*7. Plan for the Fire and Rescue Service to inspect each congregate care facility as soon as it becomes occupied; monitor earth moving operations with respect to their impact on fire safety and to provide aid in the event of accidental injuries; and conduct routine inspections of all occupied congregate care facilities to maintain emergency fire safety standards.		
*8. Plan for the use of "floor monitors" in all occupied congregate care facilities.		
*9. Identify law enforcement requirements at each Lodging Section and housing facilities within.		
*10. Identify requirements for providing security to stocks of essential supplies, such as food and fuel.		
*11. Prepare a worksheet providing details on fire protection and law enforcement requirements during the Standby Phase. This should include personnel, vehicles, and equipment and supplies as in item 6 above.		
*12. Develop a plan for assigning public safety personnel to specific shelter facilities.		
13. Compare public safety manpower, equipment, and supply requirements to the capabilities available within the host county. Identify deficiencies for inclusion in the Requirements Statement.		



## III-G. PLANNING SUPPLY AND ECONOMIC CONTROLS

## PLANNING OBJECTIVE

To plan for the control of an assistance in the supply of essential goods and services in the host county during the Relocation Period.

	PLANNING RESPONSIBILITY	PLAN REFERENCE
1. Review current policies (as stated in the State Plan) affecting economic activities under relocation conditions.		
2. Analyze the economic activities of the host county relative to the guidance in the State Plan.		
3. Prepare lists of employing organizations that are likely to be affected by crisis relocation; these include those that must be kept functioning; those that could be diverted to essential activities; and those whose operations are nonessential and may be adversely affected during crisis relocation.		
4. Determine whether changes in total population or their location or medical support arrangements would require changes in the quantities of health supplies and equipment or delivery points. Be sure to forward proposed changes to State health authorities.		
*5. Review security requirements for controlled drugs, scarce or dangerous health supplies, and fragile or specialized equipment.		
*6. Identify needs for security guard or patrols in planning public safety support, such as with commercial pharmacies.		

	PLANNING RESPONSIBILITY	PLAN REFERENCE
*7. Indicate whether delivery vehicle will be redirected at the staging areas to schools or other mass feeding locations as needed at the time, or whether deliveries will be made to normal outlets and then transferred to feeding establishments as needed.		
*8. Identify those food facilities requiring security guards and estimates the personnel requirements for use in planning public safety support.		
*9. Plan for the control of motor fuel usage.		
*10. Develop backup capabilities for fueling long-haul trucks in the host area.		
11. Prepare an inventory of fuel storage and on-site fueling capabilities.		
*12. Develop plans for giving priority to public safety and other essential services relevant to the use of gasoline.		
*13. Identify essential construction materials and equipment and develop controls for their use.		
*14. Prepare an inventory of transportation capabilities in the host county and plan for their use in support of the movement control plan and in local distribution of essential supplies.		
15. Review other items in Table 7-1 of CPG-2-8-3 to ensure that they have been adequately identified and provided for.		

### III-H. PREPARING THE OPERATIONAL PLAN

#### PLANNING OBJECTIVE

To prepare a written Crisis Relocation Plan for the host county. The Prototype Host County Plan, CPG-2-8-C-1, should be reviewed very carefully, since the discussion in the guidance is intentionally abbreviated.

#### CHECKLIST

	PLANNING RESPONSIBILITY	PLAN REFERENCE
*1. Prepare the Basic Plan to consist of:		
a. Authority for existence and implementation of the plan		
b. Situation and assumptions, including national and international scope of the situation; statewide situation (consistent with the State Crisis Relocation Plan); situation statements pertinent to the host county; and assumptions (adapted) similar to those in the prototype plan		
c. Mission statement (based on prototype plan and specifying the appropriate risk area(s))		
d. Execution, including the concept of operations; emergency organization; and support arrangements		
e. Administration and logistics		
f. Direction and control		
*2. Prepare Appendices to the Basic Plan to include organizations assigned (Appendix 1); movement routes (Appendix 2); and service coordinators (Appendix 3).		

		PLANNING RESPONSIBILITY	PLAN REFERENCE
*3.	Prepare Annexes to the Basic Plan as follows:		
a.	Direction and control		
	(1) Restatement of the mission		
	(2) Planned participation in the direction and control functions*		
	(3) Statements defining the operational situation, including an action checklist and shift arrangements		
	(4) Responsibilities, including executive (control); risk area liaison team; and EOC operations		
b.	Law and order service		
	(1) Restatement of the mission		
	(2) Planned participation in the law and order function		
	(3) Statements defining the operational situation, including an action checklist and shift arrangements		
	(4) Prepare an Appendix to the Annex to include the organization; equipment; responsibilities; assignment of specific tasks and actions; specified deployment; operating locations; schedules; and an outline of procedures and SOPs		
	(5) Prepare other Appendices as needed		

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\*During the Preparatory, Relocation, and Attack Periods. These three periods are also applicable to this same item (b(2), c(2), etc.) for each of the order Annexes covered below

		PLANNING RESPONSIBILITY	PLAN REFERENCE
c.	Fire and rescue service		
	(1) Restatement of the mission		
	(2) Planned participation in the fire and rescue function		
	(3) Statements defining the operational situation, including an action checklist and shift arrangements		
	(4) Prepare an Appendix to the Annex to include the organization; equipment; responsibilities; assignment of specific tasks and actions; specified deployment; operating locations; schedules; and an outline of procedures and SOPs		
	(5) Prepare other Appendices as needed		
d.	Health and medical service		
	(1) Restatement of the mission		
	(2) Planned participation in the health and medical functions		
	(3) Statements defining the operational situation, including an action checklist and shift arrangements		
	(4) Prepare an Appendix to the Annex to include the organization; equipment; responsibilities; assignment of specific tasks and actions; specified deployments; operating locations; schedules; and an outline of procedures and SOPs		
	(5) Prepare other Appendices as needed		
e.	Reception and care service		
	(1) Restatement of the mission		

	PLANNING RESPONSIBILITY	PLAN REFERENCE
(2) Planned participation in the reception and care functions		
(3) Statements defining the operational situation, including an action checklist and shift arrangements		
(4) Prepare an Appendix to the Annex to include the organization; equipment; responsibilities; assignment of specific tasks and actions; specified deployments; operating locations; schedules; and an outline of procedures and SOPs		
(5) Prepare other Appendices as needed		
f. Resource and supply service		
(1) Restatement of the mission		
(2) Planned participation in the reception and care functions		
(3) Statements defining the operational situation, including an action checklist and shift arrangements		
(4) Prepare an Appendix to the Annex to include the organization; equipment; responsibilities; assignment of specific tasks and services; specified deployments; operating locations; schedules, and an outline of procedures and SOPs		
(5) Prepare other Appendices as needed		

## III-I. EMERGENCY PUBLIC INFORMATION

## PLANNING OBJECTIVE

To plan for emergency instructions or guidance that would be disseminated by the mass media and through organization supervisory channels at or very near the time that crisis relocation is directed. Note that this represents only a part of the total public information requirement. Information developed in this part needs to be added to the EPI materials developed earlier during the state level planning since the latter did not deal with host area problems.

## CHECKLIST

	PLANNING RESPONSIBILITY	PLAN REFERENCE
1. Decides whether volunteered dwellings should be solicited during the earlier stages of a developing crisis or whether such action should be reserved for the time when relocation is ordered.		
*2. Plan for the preparation of guidance and instructions to host families volunteering to share their homes with relocatees.		
3. Prepare written materials based on the planning performed for Planning Supply and Economic Controls.		
*4. Plan for guidance to acquaint host families with what to expect during the relocation period. This guidance should be prepared in such a manner as to be readily disseminated by newspapers and the broadcast media.		
*5. Plan for the public information roles to be played by principal county officials.		
*6. Plan for information to be provided host area residents relevant to the decision to relocate, the need to avoid relocation routes, and the need for volunteers to take in relocated families.		

	PLANNING RESPONSIBILITY	PLAN REFERENCE
*7. Plan for information to be provided to the relocated population. Prepare EPI materials which include information regarding arrangements for their care; how to obtain fallout shelter; procedures for upgrading existing shelter; expedient shelter construction (if necessary); shelter locations, their use, etc.; health precautions and conditions in the risk area.		
*8. Plan for the issuance of information regarding return to the risk areas.		
*9. Prepare information to be made available regarding plans for defraying costs and reimbursement for damages.		
*10. Plan for guidance dealing with the return to normalcy in the host county.		
*11. Identify communications media to be used to communicate with the public.		
*12. Arrange for a central authoritative source at the EOC for approving news releases and other public information.		
*13. Make arrangements for reviewing information for accuracy, for monitoring the news media, and for dealing with rumors.		



## III-J. DOCUMENTATION OF THE PLANNING PROCESS

## PLANNING OBJECTIVE

To record the results of the work performed in producing the Host Area Plan in order to facilitate future efforts required to update the Crisis Relocation Plan.

## CHECKLIST

	RESPOSIBILITY	DATE COMPLETED
1. Prepare a planning report describing what was done during the planning. This should include:		
a. A chronological account of the planning process, beginning with the input data package and the initial on-site drive-through		
b. On-site coordination involved		
c. Lists of participants at conferences and meetings		
d. Descriptions of issues raised and dealt with during the planning process		
e. Document any unfinished work on the plan or elements that should be updated when additional information becomes available		
2. Prepare Appendices containing all worksheets developed in the planning process. I worksheets indicate location where filed. Also include descriptions of alternatives considered in the planning.		
*3. Prepare an Appendix containing examples of the standby hard copy public information for the general public.		
*4. Provide the host county civil defense staff with a complete set of all organizational assignment forms and all emergency public information materials prepared for both organizations and the general public.		

## RISK AREA CRP CHECKLISTS

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## IV-A. POLICY AND PLANNING CONSIDERATIONS

## PLANNING OBJECTIVE

To ensure that policies and planning relevant to crisis relocation are described in the documented Crisis Relocation Plan. These planning elements should include authorities and responsibilities for performing each crisis relocation-related operation.

## CHECKLIST

	PLANNING RESPONSIBILITY	PLAN REFERENCE
*1. Indicate who is authorized and responsible for initiating crisis relocation. Also be certain to cite the basis of this authority (e.g., specific legislation).		
*2. Indicate whether crisis relocation would be directed and compelled by e.g., the Governor upon receipt of a request to do so from the President. If such provisions are the result of State legislation, be certain to cite the law.		
*3. Describe the hosting policies and constraints upon which the State's crisis relocation plan is based.		
*4. Specify the anticipated movement time and relocation duration involved. Also indicate the transportation modes planned to be used, i.e., the transportation policy. Identify the number of persons (including organizations) that this plan considers for evacuation.		
*5. Describe the essential support activities to be planned for. These should include: <ul style="list-style-type: none"> <li>Those activities required to maintain essential services in support of the relocated population</li> <li>Those defense-related activities that may be required for support of urgent national security objectives, including mobilization</li> </ul>		

	PLANNING RESPONSIBILITY	PLAN REFERENCE
<ul style="list-style-type: none"> <li>Locally essential activities to maintain security in the risk area and to support those risk area residents who cannot be moved for various reasons and those who refuse to leave.</li> </ul>		
6. Describe the relocation assignment principles, being certain to take into account the principles of:		
<ul style="list-style-type: none"> <li>Equal travel requirements</li> </ul>		
<ul style="list-style-type: none"> <li>Use of host jurisdictions in a balanced fashion</li> </ul>		
<ul style="list-style-type: none"> <li>Use of non-residential and residential structures</li> </ul>		
*7. Describe the policy on the utilization of State and Federal employees in the performance or emergency duties.		
*8. Describe the current economic policies of the government for dealing with problems associated with economic dislocations affecting both relocated families and host area families.		

## IV-B. PLANNING HOST AREA SUPPORT

## PLANNING OBJECTIVE

To plan for needed support to the host counties to which the risk area population will be relocated.

## CHECKLIST

	PLANNING RESPONSIBILITY	PLAN REFERENCE
*1. Identify reception and care support needed by the host county. This represents the Reception and Care Requirements Statements and should include manpower, equipment, and supplies.		
2. Prepare a list of the facilities indicated in the Requirements Statement, and specify the organizations assigned and the number of relocatees to be housed.		
3. Investigate the availability and numbers of risk area government employees who could provide residual reception and care services.		
4. If agency employees and their dependents are to be relocated as organizational units, be sure to prepare the necessary organizational assignment forms.		
*5. Consult the central city civil defense coordinator on the role of the local Red Cross chapter (and other private relief organizations) and to include them in reception and care planning as appropriate.		
*6. Identify medical support needed by the host county. This represents the Medical Requirements Statement and should include manpower, equipment, and supplies.		
7. Review the Requirements Statements for the various host counties and make required revisions to the relocation destination or medical personnel.		

	PLANNING RESPONSIBILITY	PLAN REFERENCE
8. Obtain information (from county or city health departments) regarding the names, addresses, etc. of health care personnel.		
9. Compare the residences of health care personnel with the host counties to which they would be relocated according to the instructions planned for the general public and, if required, prepare special relocation instructions for certain health care personnel.		
10. Ensure that enough emergency health care personnel are assigned to each host county.		
11. Review State CRP plans to ensure that arrangements have been made either to release medical patients not requiring hospital care or to relocate them to host area treatment facilities.		
*12. Identify requirements for continuing the operation of risk area medical units/hospitals or for consolidation of the patient load into certain hospitals.		
13. Prepare an inventory of equipment and supplies in treatment centers and supply houses.		
*14. Develop plans for the tentative allocation of equipment and supplies to the various host counties.		
*15. Identify public health support needed by the host county. This represents the Sanitation Requirements Statement and should include manpower, equipment, and supplies.		
16. Identify requirements for sanitarians, and identify trash and garbage collection requirements in terms of equipment units.		

	PLANNING RESPONSIBILITY	PLAN REFERENCE
17. Arrange for meetings with the management of firms and government departments to discuss host area health support needs.		
18. Allocate the appropriate number of health unit teams and supervisory personnel, and prepare organizational assignment forms using the information in the Host Area planning reports.		
19. Obtain names, addresses, etc. of public health personnel.		
20. Prepare a list of needed health supplies to include their forces and destinations.		
*21. Identify construction support needed by the host county. This represents the Construction Requirements Statement and concerns upgrading host county structures for fallout protection and construction of expedient shelter.		
22. If both upgrading and expedient shelter are required, identify capacity needs for both earthmoving and trenching.		
23. Develop preliminary ideas regarding the movement of heavy earthmoving equipment to the host counties.		
24. Arrange for the participation by local government departments and private organizations in the planning of essential construction support.		
25. Brief applicable organizations on crisis relocation planning and their prospective role in the plan.		
26. Ensure that available construction support capabilities are allocated equitably among the host counties and estimate the number of days required to produce fallout protection in lieu of the three days assumed by planners.		



	PLANNING RESPONSIBILITY	PLAN REFERENCE
*27. Identify other construction support requirements relevant to manpower, equipment, and supplies.		
*28. Identify shelter requirements to accommodate the essential work force, in addition to shelter requirements for the relocated population.		
*29. Identify firefighting support needed by the host county. This represents the Firefighting Requirements Statement and should include fire protection and fire suppression.		
*30. Plan for firefighting support relevant to manpower, vehicles, and equipment/supplies.		
*31. Identify law and order support needed by the host county. This represents the Law and Order Requirements Statement and concerns traffic control and security.		
*32. Plan for law and order support relevant to manpower, vehicles, and equipment/supplies.		
*33. Identify other support requirements. This represents the "Other" Requirements Statement and should include manpower, equipment, and supplies.		

## IV-C. PLANNING RISK AREA OPERATIONS

## PLANNING OBJECTIVE

To plan for those essential activities which must be undertaken at fixed facilities in the risk area during the relocation period.

## CHECKLIST

	PLANNING RESPONSIBILITY	PLAN REFERENCE
1. Review the list of facilities and organizations involved in risk area <u>operations</u> with local authorities to determine whether any major changes have occurred since the State level planning.		
*2. Plot each facility involved in risk area operations on a suitable map of the risk area.		
3. Review the manner in which facilities were grouped into operating areas during State level planning, and review the sites selected as Staging Areas. Note deficiencies and possible improvements.		
4. Review the organizational assignment forms for those organizations involved in risk area operations. These should be reviewed for completeness and appropriate host area relocation headquarters.		
5. Schedule a planning visit to each operating site.		
6. Review with local officials the earlier planning and outline the general risk area operations.		
*7. Plan for the control of risk area operations and support from a central EOC.		
*8. Estimate the number of shift workers required to perform the contemplated risk area operations and develop plans for their use.		

	PLANNING RESPONSIBILITY	PLAN REFERENCE
<p>*9. Establish support facilities and plan for activities to be performed at these facilities as follows:</p> <p>a. Staging Areas, including on shift feeding; emergency medical care; vehicle refueling; emergency repairs; generalized support to risk area operations; and the staging area's role as subordinate command center to the EOC and as Shelter Complex Headquarters</p> <p>b. Access Control Points, including limiting access to risk area to authorized traffic; providing route guidance and vehicle parking for trucks; providing a base for public safety forces; and clearing inbound traffic from roads in event of attack warning</p>		
<p>*10. Provide for the protection of risk area workers from direct weapons effects as follows:</p> <p>a. Tactical evacuation, including evaluating the evacuation options for each operating area or essential facility; identifying and recording escape routes, where evacuation seems feasible; planning for transportation; and, if escape routes are <u>not</u> in the direction of the workers' host areas, investigating the availability of fallout shelters in the escape direction.</p> <p>b. All-effects shelter. Determine whether an all-effects shelter survey has been performed by DCPA in the risk areas and whether results are available for the facilities of interest. If not, arrange for a qualified shelter analyse to be part of the team visiting the sites of risk area operations.</p>		

	PLANNING RESPONSIBILITY	PLAN REFERENCE
*11. Summarize the risk area operations and record anticipated changes in normal services.		
12. Records the results of visits to risk area sites as they occur for use in preparing movement and support plans and in preparing the risk area operations plan and supporting materials.		

## IV-D. PLANNING THE MOVEMENT OF PEOPLE

## PLANNING OBJECTIVE

To plan for the orderly relocation of the risk area population to the designated host counties.

## CHECKLIST

	PLANNING RESPONSIBILITY	PLAN REFERENCE
1. Determine the routes to be used for the evacuation.		
2. Determine that the vehicular capacity on evacuation routes is adequate to accommodate the number of evacuees. Multiply the number of lanes available (from item 1 above) by 1000 and then multiply this result by the average number of persons per household. The result represents the maximum number of persons who can leave the risk area each hour.		
*3. Plan for measures to provide periodic, if not continuous, information on traffic conditions leading to and on the various outbound routes. This requires the preparation of traffic monitoring procedures.		
4. Make an analysis of the number of persons in the risk area who need transportation.		
*5. Develop plans for providing public transportation for those evacuees without access to auto.		
*6. Develop plans for the relocation of essential organizations including government, institutions, industry, and business.		
*7. Prepare special relocation scheduling for organizations in the host area support category that are involved in the movement of needed equipment and supplies, such as construction equipment.		

	PLANNING RESPONSIBILITY	PLAN REFERENCE
8. Meet with the transportation officials concerned to work out the details of the plan.		
*9. Develop plans to ensure orderly access to, and smooth traffic flow on, outbound routes. This should include determining whether it is feasible to attempt to maintain normal traffic controls.		
10. Review recommended movement controls (both positive and negative) in light of the manpower and training requirements to ensure operations.		
*11. Plan for the preparation of instructions to the general public (unattached families, including those needed transportation) on "where to go and what to do." This includes plans for printed materials and plans for the broadcast media to reinforce the information.		
12. Plan for the preparation of instructions to organizational employees.		
13. Document the results of planning for the movement of people in such a manner as to permit the results to be reviewed and concurred upon by local risk area authorities.		
*14. Summarize the movement plan (and include supporting maps) for later inclusion in the risk area operational plan and as an input to the planning for movement of supplies and equipment; planning risk area support; and preparing public information materials.		

## IV-E. PLANNING THE MOVEMENT OF EQUIPMENT AND SUPPLIES

## PLANNING OBJECTIVE

To develop plans for meeting the minimum augmentation needs of the host counties.

## CHECKLIST

	PLANNING RESPONSIBILITY	PLAN REFERENCE
*1. Determine what truck-type equipment is to be driven to the host counties by drivers who normally operate the equipment.		
*2. Determine what equipment is to be transported to the host counties by flat-bed truck and by rail.		
*3. Plan for the movement of essential portable equipment and supplies.		
4. Consult the host area support summary for the listing of supplies and their normal locations in the risk area.		
5. Identify needed truck drivers and laborers required to load and unload the trucks.		
6. Prepare organizational assignment forms for all organizations and workers identified for supply movement. Also be sure to append to the forms a planned schedule to supply loading and movement.		
*7. Consult the local civil defense coordinators regarding the numbers and locations of RADEF instrument kits. Determine which instruments are to be retained in the risk area and which are to be transported to the host counties.		
8. Consult the truckers to be involved in the movement of specialized supplies regarding the preferred procedures and the drafting of emergency bills of lading.		

	PLANNING RESPONSIBILITY	PLAN REFERENCE
*9. Summarize the planning results for the movement of equipment and supplies and update and extend the movement plan previously developed.		
10. Prepare organization relocation forms and indicate (on the reverse side) the reception and care needs and movement schedule.		
11. File all planning materials to ensure their availability for later planning risk area support, preparing the crisis relocation plan, and developing crisis information materials.		



## IV-F. PLANNING RISK AREA SUPPORT

## PLANNING OBJECTIVE

To plan for those activities required to (1) aid the orderly exodus of the risk area population and essential equipment and supplies; (2) support risk area operations; (3) maintain the integrity of the most vacated risk area; and (4) maintain civil defense readiness in the event of attack warning.

## CHECKLIST

	PLANNING RESPONSIBILITY	PLAN REFERENCE
*1. Select a protected facility to serve as the risk area EOC and identify at least one Staging Area in each operating area.		
2. Total the number of workers per shift for each operating area relevant to essential workers in facilities having uninterruptible functions and workers in all facilities involved in risk area operations.		
3. Summarize the above totals in a list of operating areas for later planning use.		
*4. Arrange for Access Control Points on each major highway entering the risk area.		
*5. Plan for Direction and Control staffing of the EOC, Staging Areas, and Control Points.		
*6. Review State level planning regarding the preliminary identification of EOC staffing and now perform more detailed planning.		
*7. Identify and plan for law enforcement operating requirements for the movement phase, the operating phase, and the return phase.		

	PLANNING RESPONSIBILITY	PLAN REFERENCE
*8. Document the law enforcement operating responsibilities to form a basis for the preparation of the Law Enforcement Service Annex to the operational plan and the Appendices to the Annex.		
9. Prepare or modify organizational assignment forms for all participating law enforcement agencies to reflect host county and risk area assignments.		
*10. Identify and plan for the fire and rescue operating requirements for the movement phase, the operating phase, and the return phase.		
*11. Document the fire and rescue operating responsibilities to form a basis for the preparation of the Fire Annex and department Appendices of the risk area Crisis Relocation Plan.		
12. Prepare or modify organizational assignment forms for the participating fire and rescue agencies to reflect host county and risk area assignments.		
*13. Assign operational responsibility for mobile medical aid and identify and plan for mobile medical aid operating requirements for the movement phase, the operating phase, and the return phase.		
*14. Document the mobile medical aid operating responsibilities to form a basis for the preparation of the Mobile Medical Aid portion of the operational plan.		
15. Prepare or modify organizational assignment forms for the participating mobile medical aid agencies to reflect host county and risk area assignments.		

	PLANNING RESPONSIBILITY	PLAN REFERENCE
16. Identify and plan for the medical support requirements for the movement phase, the operating phase, and the return phase.		
*17. Document the medical support responsibilities to form a basis for the preparation of the Medical Support portion of the operational plan.		
18. Prepare or modify organizational assignment forms for the participating medical support organizations to reflect host county and risk area assignments.		
*19. Plan for the best available blast-resistant shelter space at all risk area work locations for the maximum number of people that would be at these locations during the Relocation Period (except for Access Control Points and facilities at or close to the boundary of the risk area). Shelter should be provided whether or not tactical evacuation is provided.		
*20. Prepare a plan for the construction and equipping of risk area shelters for inclusion in the Resource and Supply Annex to the operational plan and its supporting Appendices.		
*21. Plan for providing human care during the Relocation Period and plan for shelter , management during the Attack period.		
*22. Prepare plans to ensure that risk area support and operations personnel on duty during the movement phase are provided some sort of mid-shift meal on station.		

	PLANNING RESPONSIBILITY	PLAN REFERENCE
*23. Include provisions in the public information plan to broadcast frequently to the stay-puts advising them that help is available at the Staging Area.		
*24. Provide for the assignment of experienced counsellors to each Staging Area for the purpose of providing sympathetic and responsive attention to the concerns of stay-puts.		
*25. Plan for commuting operations for organizations engaged in risk area operations to include an integrated transportation plan identifying which buses go where in shifting from the relocation task to the commuting task.		
*26. Identify requirements and plan for local transportation within and between operating areas.		
*27. Plan for refueling and repair requirements.		
*28. Plan for ensuring the availability of essential goods and services during the Movement Phase.		
29. Arrange for orderly procedures for store and service station managers to deposit keys with the police or some other local agency.		
*30. Plan for the continuing supply support of primary and secondary industrial facilities and residential facilities (e.g., through or by Staging Areas).		
*31. Arrange for advising organizations engaged in risk area operations and support to contact the Resource and Supply Service contingent in their Staging Area for the sort of support they would normally obtain from other sources.		

		PLANNING RESPONSIBILITY	PLAN REFERENCE
32.	Summarize and document the results of the planning described in this section of the guidance so that the essentials can be included in the appropriate parts of the risk area operational plan.		
33.	Perform a complete review of the concept of operations, host area support, movement plans, and risk area operations and support in order to perform the remaining elements of the Part IV planning.		
34.	Prepare new/modified organizational assignments derived from risk area support and adjust departure schedules as appropriate.		

## IV-G. PREPARING THE OPERATIONAL PLAN

## PLANNING OBJECTIVE

To prepare a written Crisis Relocation Plan for the risk area. Reference 16 (Prototype Risk Area Crisis Relocation Operational Plan) should be reviewed very carefully, since the discussion in the guidance is intentionally abbreviated.

## CHECKLIST

	PLANNING RESPONSIBILITY	PLAN REFERENCE
*1. Prepare the Basic Plan to consist of:		
a. Authority for existence and implementation of the plan		
b. Situation and assumptions, including the national and international scope of the situation; statewide situation (consistent with the State Crisis Relocation Plan); situation pertinent to the risk area; and assumptions (adapted) similar to those in the prototype plan		
c. Mission statement (based on prototype plan but particularized to the appropriate risk area and county means)		
d. Execution, including the concept of operations, emergency organization, and support arrangements		
e. Administration and logistics		
f. Direction and control		
*2. Prepare Appendices to the Basic Plan to include organizations assigned (Appendix 1); movement routes (Appendix 2); and service coordinators (Appendix 3).		
*3. Prepare Annexes to the Basic Plan as follow:		
a. Direction and control		

	PLANNING RESPONSIBILITY	PLAN REFERENCE
(1) Restatement of the mission		
(2) Planned participation in the direction and control functions*		
(3) Statement defining the operational situation, including an action checklist and shift arrangements.		
(4) Responsibilities, including executive (control); host area liaison team; and EOC operations		
b. Law and order service		
(1) Restatement of the mission		
(2) Planned participation in the law and order function		
(3) Statements defining the operational situation, including an action checklist and shift arrangements		
(4) Prepare an Appendix to the Annex to include the organization; equipment; responsibilities; assignment of specific tasks and actions; specified deployments; operating locations; schedules; and an outline of procedures and SOPs		
(5) Prepare other Appendices as needed		
c. Fire and rescue service		
(1) Restatement of the mission		
(2) Planned participation in the fire and rescue function		

\*During the Preparatory, Relocation, and Attack Periods. These three periods are also applicable to this same item (b(2), c, (2), etc.) for each of the other Annexes covered below.

	PLANNING RESPONSIBILITY	PLAN REFERENCE
(3) Statements defining the operational situation, including an action checklist and shift arrangements		
(4) Prepare an Appendix to the Annex to include the organization; equipment; responsibilities; assignment of specific tasks and actions; specified deployment; operating location; schedules; and an outline of procedures and SOPs		
(5) Prepare other Appendices as needed		
d. Health and medical service		
(1) Restatement of the mission		
(2) Planned participation in the health and medical functions		
(3) Statements defining the operational situation, including an action checklist and shift arrangements		
(4) Prepare an Appendix to the Annex to include the organization; equipment; responsibilities; assignment of specific tasks and actions; specified deployments; operating locations; schedules; and an outline of procedures and SOPs		
(5) Prepare other Appendices as needed		
e. Reception and care service		
(1) Restatement of the mission		
(2) Planned participation in the reception and care functions		
(3) Statements defining the operational situation. including an action checklist and shift arrangements		



	PLANNING RESPONSIBILITY	PLAN REFERENCE
(4) Prepare an Appendix to the Annex to include the organization; equipment; responsibilities; assignment of specific tasks and actions; specified deployments; operating locations; schedules; and an outline of procedures and SOPs		
(5) Prepare other Appendices as needed		
f. Resource and supply service		
(1) Restatement of the mission		
(2) Planned participation in the resource and supply functions		
(3) Statements defining the operational situation, including an action checklist and shift arrangements		
(4) Prepare an Appendix to the Annex to include the organization; equipment; responsibilities; assignment of specific tasks and services; specified deployments; operating locations; schedules; and an outline of procedures and SOPs		
(5) Prepare other Appendices as needed		

## IV-H. PREPARING EMERGENCY RELOCATION INSTRUCTIONS

## PLANNING OBJECTIVE

To plan for the development of the materials that would be disseminated by the mass media, by the distribution of printed information, and through organizational channels at or very near the time that relocation is directed. Information developed in this part needs to be added to the EPI materials developed earlier under State level planning since the latter did not deal with host area problems.

## CHECKLIST

	PLANNING RESPONSIBILITY	PLAN REFERENCE
*1. Prepare plans for conveying a sense of preparedness and organization to the general public and those assigned a special role.		
*2. Prepare instructional materials for the government agencies, private businesses, and institutions that have been assigned specific relocation headquarters or support functions; persons regarding transportation among the general public; and the remaining general public.		
*3. Plan for the mass distribution of a newspaper supplement type of document to the general public.		
*4. Arrange for the broadcast of information (beginning at the time relocation is directed) from the EOC.		
*5. Arrange for providing the general public with telephone numbers where they can call for special assistance and plan for the inclusion of radio broadcast aimed at stay-puts.		

## IV-I. DOCUMENTATION OF PART IV PLANNING

## PLANNING OBJECTIVE

To record the results of the work performed in producing the Risk Area planning in order to facilitate future efforts required to update the Crisis Relocation Plan.

## CHECKLIST

	RESPONSIBILITY	DATE COMPLETED
1. Prepare a planning report describing what was done during the Risk Area planning. This should include:		
a. A chronological account of the planning process		
b. On-site coordination involved		
c. Lists of participants at conferences/ meetings and descriptions of issues raised and dealt with		
d. Considerations entering into the preparation of emergency relocation instructions		
e. An indication as to whether or not all or parts of the draft plan have received formal approval		
2. Prepare an Appendix to the report to contain input information from earlier State and Host Area planning.		
3. Prepare an Appendix containing examples of the standby hard copy information for the general public, if they are not already included in the draft plan.		
4. Provide the civil defense staffs of the central city and other risk area jurisdictions with a copy of the draft plan; all emergency information materials prepared during the course of the planning; a complete set of organizational assignment forms for organizations within their jurisdictions; and a copy of the Risk Area planning report.		

		RESPONSIBILITY	DATE COMPLETED
5.	Discuss plans for the accomplishment of Part V planning with local authorities.		
6.	Provide State and DCPA Region with copies of the Risk Area planning report and the draft risk area Crisis Relocation Plan.		
7.	Provide copies of the organizational assignment forms for those organizations that were added after completion of Host Area planning to the State (or DCPA Region, if interstate movement is involved) for transmission to the affected host counties.		
8.	Prepare a county-by-county summary of host area support arrangements in response to the Requirements Statement so that these arrangements can be incorporated explicitly in the appropriate host county plans.		

## APPENDIX C

### Explanation of CRP Host Area Survey Printouts

Explanation of  
NATIONAL SHELTER SURVEY ALL FACILITY LISTING  
and  
NATIONAL SHELTER SURVEY ALL FACILITY SUMMARY

A. General. The All Facility Listing will contain single line entries for all facilities recorded in the national inventory and summary level totals for each County, State and the U.S.

The one-line listing formats, Attachment 1 and 2, display italic item numbers above the printed headings which correspond to the item numbers shown and explained below:

B. NSS All FACILITY LISTING

<u>Item</u>	<u>Heading</u>	<u>Explanation</u>
1	<u>NSS ALL FACILITY LISTING</u>	Report title
2	<u>PAGE</u>	Report page number
3	<u>AS OF (DATE)</u>	Effective date of information displayed in the listing
4	<u>LOCAL JURISDICTION</u>	Name of local jurisdiction, county, city township etc.
5	<u>1970 POPULATION</u>	1970 Census population
6	<u>FAC NO</u>	Facility number. The left most position of the facility number is coded as shown in Figure 1
7.a	<u>MCD</u>	Minor Civil Division (MCD), such as towns, townships, precincts, etc. In certain areas MCD's are referred to as Census County Division (CCD). MCD's (CCD's) divide the County geography alphabetically by their names. The three-digit numeric code assigned for each follows this sequence.
7.b	<u>PLACE</u>	The term "place" refers to concentration of population generally divided as incorporated cities, towns, villages, or boroughs and in certain instances unincorporated places are identified in the Place Code scheme. The Code is a four-digit number assigned to each State according to the alphabetic sequence and places are unique within a State but boundaries may cross boundary and MCD/CCD lines.

<u>Item</u>	<u>Heading</u>	<u>Explanation</u>
8	<u>RSAC-SLA</u>	RSAC is a Region, State, Area, County Code as determined in the National Location Code, OCD-OEP, dated 1962. SLA is a Standard Location Area Code as determined in the National Location Code, OCD-OEP, dated 1962.
9	<u>BUILDING NAME</u>	Building name or descriptive name.
10	<u>BLDG NUMBER</u>	Building number.
11	<u>DIR</u>	Direction of the building when the direction precedes the street name.
12	<u>STREET NAME</u>	Street name.
13	<u>CITY</u>	City.
14	<u>FALLOUT SHELTER SPACES</u>	The heading for fallout shelter spaces displayed beneath the following subheadings:
	a. <u>PF CAT</u>	PF category 0 spaces.
	b. <u>PF CAT I</u>	PF category I spaces.
	c. <u>PF CAT 2-3</u>	PF category 2-3 spaces.
	d. <u>PF CAT 4+</u>	PF category 4+ spaces.
	e. <u>TOTAL BSMT</u>	Total Spaces in the basement(s).
15	<u>BLAST SHELTER, CODE AND SPACES</u>	The heading for relative blast shelter as recorded beneath the following subheadings.
	a. <u>CDE</u>	Relative blast code for floors 1 through 3.
	b. <u>FLOOR 1-3</u>	Relative blast spaces located on floor 1 through 3.
	c. <u>CDE</u>	Relative blast code for basement(s).
	d. <u>TOTAL BSMT</u>	Total relative blast spaces located in basement(s).
16	<u>CRP SPACES</u>	The heading for Crisis Relocation Planning (CRP) information as recorded beneath the following subheadings:

Item	Heading	Explanation														
	a. <u>CONG, CARE</u>	Congregate care spaces. Spaces are determined as 40 square feet of usable area per space.														
17	<u>DESCRIPTIVE CODE</u>	The heading for descriptive codes recorded beneath the following subheadings:														
	a. <u>FIRE</u>	Overall fire vulnerability code developed by the Relative Fire Vulnerability survey. Codes and ranges are shown below:														
		<table><tr><th><u>CODE</u></th><th><u>RANGE</u></th></tr><tr><td>A</td><td>46-51</td></tr><tr><td>B</td><td>39-45</td></tr><tr><td>C</td><td>32-38</td></tr><tr><td>D</td><td>25-31</td></tr><tr><td>E</td><td>18-24</td></tr><tr><td>F</td><td>13-17</td></tr></table>	<u>CODE</u>	<u>RANGE</u>	A	46-51	B	39-45	C	32-38	D	25-31	E	18-24	F	13-17
<u>CODE</u>	<u>RANGE</u>															
A	46-51															
B	39-45															
C	32-38															
D	25-31															
E	18-24															
F	13-17															
	b. <u>SF</u>	Special facility code, Figure I.														
	c. <u>OWN</u>	Ownership code, Figure I.														
	d. <u>USE</u>	Use code, Figure I.														
18	<u>UPDT CODE</u>	The date of the most recent input recorded in the NSS-CRP national inventory for the facility.														
19		Microfiche index number.														
C. <u>NSS-CRP All Facility Summary.</u> The NSS-CRP All Facility Summary summarizes the facility information and displays totals for each county, State, region, and the U.S.																
Item	Heading	Explanation														
1	<u>NSS ALL FACILITY SUMMARY</u>	Report title.														
2a	<u>AS OF (DATE)</u>	Effective date of information displayed in the summary.														
2b	<u>PAGE</u>	Page number of summary.														
3	<u>REGION</u> or	The DCPA Region.														
4	<u>STATE</u> or	The State name.														
5	<u>LOCAL JURISDICTION</u>	The county name or applicable local juris-														



<u>Item</u>	<u>Heading</u>	<u>Explanation</u>
		diction, i.e., city, township, etc.
6	<u>FALLOUT SHELTER</u>	The heading for fallout shelter facilities and spaces displayed beneath the following subheadings:
	a. <u>FACILITIES</u>	Total facilities with PF category 0 or better fallout shelter spaces.
	b. <u>PF CAT 0-1 SPACES</u>	Total PF category 0-1 fallout shelter spaces.
	c. <u>PF CAT 2-3 SPACES</u>	Total PF category 2-3 fallout shelter spaces.
	d. <u>PF CAT 4+ SPACES</u>	Total PF category 4+ fallout shelter spaces.
	e. <u>BSMT SPACES</u>	Total fallout shelter spaces located in basements, subbasements and other belowground fallout protected areas.
7	<u>BLAST SHELTER</u>	The heading for relative blast shelter facilities and spaces displayed beneath the following subheadings.
	a. <u>FACILITIES</u>	Total facilities with relative blast shelter.
	b. <u>FLR 1-3 SPACES</u>	Total relative blast shelter spaces located on the 1st through 3rd floors.
	c. <u>BSMT SPACES</u>	Total relative blast shelter spaces located in basements, subbasements, and other belowground areas.
8	<u>CRP SURVEY-CONGREGATE CARE</u>	The heading for congregate care facilities and spaces displayed beneath the following subheadings:
	a. <u>FACIL</u>	Total congregate care facilities.
	b. <u>SPACES</u>	Total spaces located in congregate care facilities.
9-24		Totals are displayed beneath the above described headings, Item 1-8, for the following selected conditions:
9	<u>TOT FACILITIES AND SPACES</u>	Total facilities in the NSS-CRP inventory.

<u>Item</u>	<u>Heading</u>	<u>Explanation</u>
10	<u>FACILITIES WITHOUT SHELTER</u>	Total facilities in the NSS-CRP inventory without shelter spaces.
11	<u>FAC W/PF CAT 2+ SPACES</u>	Total facilities with PF category 2+ fallout shelter spaces.
12	<u>FAC W/PF CAT 2+ (50+ SPACES)</u>	Total facilities with 50 or more PF category 2+ fallout shelter spaces.
13	<u>FAC W/PF CAT 4+ SPACES</u>	Total facilities with PF category 4+ fallout shelter spaces.
14	<u>FAC W/ONLY PF CAT 0-1 SPACES</u>	Total facilities containing only PF category 0-1 fallout shelter spaces.
15	<u>FAC W/ONLY PF CAT 2+ SPACES</u>	Total facilities containing only PF category 2+ fallout shelter spaces.
16	<u>FAC W/ONLY PF CAT 4+ SPACES</u>	Total facilities containing only PF category 4+ fallout shelter spaces.
17	<u>FAC W/BSMT (BSMT SPACES ONLY)</u>	Total facilities containing basement spaces only.
18	<u>FAC W/ONLY BLAST SPACES</u>	Total facilities containing relative blast shelter spaces only.
19	<u>FACILITIES LICENSED</u>	Total facilities licensed.
20	<u>FACILITIES POSTED</u>	Total facilities posted.
21	<u>USE CLASS GROUPINGS</u>	Total facilities by Use Class groupings, as defined in Figure I, and listed for the following subheadings:
a.	<u>RESIDENTIAL</u>	Residential facilities, codes 11,12,13,14, 15, and 19.
b.	<u>EDUCATIONAL</u>	Educational facilities, codes 2,22,23,24, 25,26, and 29.
c.	<u>RELIGIOUS</u>	Religious facilities, codes 31,32, and 39.
d.	<u>GVT-PUBLIC SERVICE</u>	Government and public service facilities, codes 41,42,43,44,45,46,47, and 49.

<u>Item</u>	<u>Heading</u>	<u>Explanation</u>
	e. <u>COMMERCIAL</u>	Commercial facilities, codes 51,52,53, 54,55,56,57, and 59.
	f. <u>INDUSTRIAL</u>	Industrial facilities, codes 61,62, and 69.
	g. <u>AMUSEMENT-MEETING</u>	Amusement and meeting facilities, codes 71,72, and 79.
	h. <u>TRANSPORTATION</u>	Transportation facilities, codes 81,82, 83,84,85,86,87,88, and 89.
	i. <u>OTHER</u>	Miscellaneous facilities, code 99.
22	<u>OWNERSHIP</u>	Total facilities by ownership groupings, Figure I, and listed for the following subheadings:
	a. <u>FEDERAL GVT</u>	Federal government-owned including military, code I.
	b. <u>STATE GVT</u>	State government-owned, code 2.
	c. <u>LOCAL GVT</u>	Local government-owned, code I.
	d. <u>PRIVATE-OTHER</u>	Privately-owned, and owned by other than those itemized, codes 4 and 5.
23	<u>SPECIAL FACILITIES</u>	Total special facility groupings, Figure I, and listed for the following subheadings.
	a. <u>MINES</u>	Mines, code I.
	b. <u>CAVERNS-CAVES</u>	Caverns and caves, code 2.
	c. <u>TUNNELS-SUBWAYS-UNDERPASSES</u>	Tunnels, subways and underpasses, codes 3,4, and 5.
	d. <u>OTHER</u>	Storage type, inactive military works and other special facilities, codes 6, 8, and 9.

<u>Item</u>	<u>Heading</u>	<u>Explanation</u>
24	<u>MILITARY FACILITIES</u>	Total military and sensitive facilities as defined in the Facility Number Code (First Digit) and Figure I, are grouped for the following subheadings:
	a. <u>ARMY</u>	Army facilities, codes 1 and 2.
	b. <u>NAVY</u>	Navy facilities, codes 3 and 4.
	c. <u>AIR FORCE</u>	Air Force facilities, codes 5 and 6.
	d. <u>ERDA, NASA, NSA</u>	Environmental Research Development Agency (ERDA), National Aeronautic Space Agency (NASA), and National Security Agency (NSA), codes 7 and 8.

# **FACILITY NUMBER CODE (First digit)**

The codes, as described below, will be placed as the first digit or the left-most figure of the 5-digit facility number to identify sensitive Federal facilities and certain open facilities. A sensitive facility as used here, is one which requires a security clearance for entrance.

## First digit code

- 0 Facilities not covered below
- A Army National Guard Armories
- B Army Reserve Centers
- C NAV/MAR Corps Reserve Training Centers
- D Air Force Reserve Centers
- E Air National Guard Armories
- F Coast Guard
- 1 U.S. Army - open
- 2 U.S. Army - sensitive
- 3 U.S. Navy - open
- 4 U.S. Navy - sensitive
- 5 U.S. Air Force - open
- 6 U.S. Air Force - sensitive
- 7 ERDA, NASA, NSA - open
- 8 ERDA, NASA, NSA - sensitive
- 9 Other Federal Government - sensitive

## X= CRP Facility only

\* NOTE - Includes: Privately-owned, State and local government; Federal Government office buildings; Military industrial plants and military supply activities not having quarters and family housing; U.S. Army Civil Works structures not located on an active military installation; Privately-owned facilities in which military activities are tenants.

## **OWNERSHIP CODES**

The code in this section represents who the owner actually is, rather than the tenant.

- 1 Federal Government
- 2 State Government
- 3 Local government
- 4 Private
- 5 Other

## **SPECIAL FACILITIES CODES**

- 1 Mines
- 2 Cavern or cave
- 3 Tunnel
- 4 Subway
- 5 Underpass
- 6 Storage type
- 8 Inactive military works
- 9 Other
- 0 Not Special Facility

# **PHYSICAL VULNERABILITY CODES**

The physical vulnerability codes given in this section are intended to represent as nearly as possible the vulnerability of typical facilities of each type described.

## PV/ code TYPE OF FACILITY

- 11 Quonset type, single-story building
- Wood-framed buildings**
  - 21 Single-story or multistory dwelling
  - 22 Single-story or multistory commercial or industrial building
  - Wall-bearing buildings**
    - 31 Single-story dwelling
    - 32 Single-story commercial or industrial
    - 33 Two-story dwelling
    - 34 Two-story commercial or industrial
    - 35 3-5 story buildings
    - 36 6-8 story buildings
    - 38 Multistory monumental-type buildings
  - Steel-framed buildings**
    - 41 Single-story very light steel frame industrial or commercial
    - 42 Single-story light steel frame, no cranes or cranes of less than 10 tons, industrial
    - 43 Multistory, conventional design, commercial
    - 44 Multistory, light industrial
    - 45 Single-story, industrial with 10-25 ton cranes
    - 46 30-50 ton cranes
    - 47 60-100 ton cranes
    - 48 Over 100 ton cranes
    - 49 Steel-framed multistory, earthquake resistant
  - Reinforced concrete frame buildings**
    - 51 Single-story, very light frame, industrial or commercial
    - 52 Single-story, light frame, no cranes or cranes of less than 10 tons, industrial
    - 53 Single-story, industrial 10-25 ton crane
    - 54 30-50 ton cranes
    - 55 60-100 ton cranes
    - 56 Over 100 ton cranes
    - 57 Multistory, conventional commercial
    - 58 Multistory, industrial
    - 59 Multistory, earthquake resistant
    - 91 Multistory, windowless blast-resistant design
  - Composite framed buildings (structural steel and concrete)**
    - 61 Single-story, no cranes or cranes of less than 10 tons
    - 62 Single-story, 10-50 ton cranes
    - 71 Tunnel, and earth covered structures
    - 81 Mines and deep underground facilities

# **USE CLASS CODES**

The use class code given in this section represents how the structure is currently utilized.

## **Residential**

- 11 Apartment/hotel
- 12 Dormitory/barracks
- 13 Row houses and duplexes
- 14 Motels/tourist courts
- 15 Condominiums
- 19 Other

## **Educational**

- 21 Kindergarten/elementary school
- 22 Junior high/preparatory school
- 23 College/university
- 24 Business/professional/industrial school
- 25 Correctional schools
- 26 Library-museum
- 29 Other

## **Religious**

- 31 Church/synagogue
- 32 Retreat/monastery/convent
- 39 Other

## **Government and Public Service**

- 41 Hospital
- 42 Clinic
- 43 Unities
- 44 Communication facilities
- 45 Offices
- 46 Jails/prisons/correctional institutions
- 47 Armories/monuments/memorials
- 49 Other

## **Commercial**

- 51 Offices
- 52 Food stores
- 53 Stores other than food stores
- 54 Warehouses
- 55 Banks/financial institutions
- 56 Restaurants/cafeterias/bars/snack bars
- 57 Contractors/building supplies
- 59 Other

## **Industrial**

- 61 Factory/plant/manufacturing center
- 62 Food processing plants
- 69 Other

## **Amusement/Meetings**

- 71 Theatre/auditorium
- 72 Community center
- 79 Other

## **Transportation**

- 81 Railroad station/terminal
- 82 Bus station/terminal
- 83 Airport terminal
- 84 Airport hangars
- 85 Marine terminal
- 86 Automotive repair and storage
- 87 Automotive sales
- 88 Gasoline service stations
- 89 Other

## **Miscellaneous**

- 99 Categories not covered above

Figure 1

# **STATE, REGION & FIELD OFFICE CODES**

Region	FO Code	State Abbreviations
One	10	CT, MA, ME, NH, RI, VT
One	15	NJ
One	16	NY
Two	20	DC, DE, MD, PA, VA, WV
Three	30	AL, FL, GA, KY, MS, NC, SC, TN
Four	40	IL, IN, MI, MN, OH, WI
Five	50	AR, LA, NM, OK, TX
Six	60	CO, MT, ND, SD, WY
Six	61	IA, KS, MO, NE
Six	69	UT
Seven	70	AK, CA, HI, NV, AZ
Eight	80	AK, ID, OR, WA

## **GENERAL INFORMATION**

## **PROTECTION FACTOR CATEGORIES**

In order to reduce the voluminous protection factor numbers to a manageable quantity, protection factors are grouped into nine PF categories and ranges as shown below:

Protection Factor (PF)	Reduction Factor
Category	Range
8	Over 1,000
7	500-1,000
6	250-499
5	150-249
4	100-149
3	70-99
2	40-69
1	20-39
0	10-19
X	1-9
	.001 or less
	.002-.001
	.004-.002
	.007-.004
	.010-.007
	.014-.010
	.025-.014
	.050-.025
	.100-.050
	1.000-1.00

## **SPECIAL INSTRUCTIONS**

To eliminate possible sources of error, the following alphabetic letters will be printed as indicated:

- O with a slash Ø
- I with a bar İ
- Z with a bar Ž
- S with a line Š

1 NSS ALL FACILITY LISTING 3 AS OF SEPT 30, 1978														2 PAGE 8209	
4 COOK 7a 6 FAC NO.	7b 5 MCD-PLACE-RSAC-SLA 4121 0960	9 BUILDING NAME	10 BLDG NUMBER	11 STREET NAME	12 CITY	14 FALLOUT SHELTER SPACES				15 BLAST SHELTER CODE AND SPACES				16 CRP SPACES	DESCRIP CODE F I D U E F M E
						a	b	c	d	e	a	b	c		
						PF CAT 0	PF CAT 1	PF CAT 2-3	PF CAT 4	TOTAL BSAT E	FLOOR D	TOTAL BSAT E	CONG. CARE		
06511	BARB PUB SCHOOL S BLD G TUNN EL	310 S HOUH				0	200	100	27	27	0	0	0	0	0 3 22 0566
06514	GROVE ST SCHOOL 901 G ROVE & AR RINGTON ILL					0	0	632	0	632	0	0	0	0	0 3 21 0369
MCD	PLACE	RSAC 4121 SLA 0961													
06606	ILL BELL TELEPHONE 20 0 MAIN & ARTLETT ILL					0	246	0	281	281	0	0	0	0	0 4 44 0566
MCD	PLACE	RSAC 4121 SLA 0962													
06702	BARWOOD FUNERAL CHAPE L RT20 S TADAMWOOD					0	0	46	0	46	0	0	0	0	0 4 99 0169
06703	STREET JRHS LEVING PARK RD ST RE ARWOOD ILL					0	3340	286	2100	0	0	0	0	0	0 3 22 0169
06704	STREET JRHS GYM IRVING PARK R D STADAMWOOD					0	0	242	0	0	0	0	0	0	0 3 22 0169
06705	OAK HILL SCHOOL 502 O LTENDO RF STADAMWOOD					0	107	0	1450	0	0	0	0	0	0 3 21 0169
06709	ELGIN SENIOR HIGH SCH 1200 WARDON DR				ELGIN	2630	3936	0	0	150 E 13990 G	960	0	0	0	0 3 22 0274
MCD	PLACE	RSAC 4121 SLA 0963													
06810	GEN OFF PURE OIL CO P ALATINE E ILL					0	0	0	100	100	0	0	0	0	0 4 59 1263
MCD	PLACE	RSAC 4121 SLA 0964													
06903	940 E NORTHWEST HIGHWAY MT PR OSPDCT ILL					0	0	34	0	34	0	0	0	0	0 4 51 1263
06904	940 E NORTHWEST HIGHWAY MT PR OSPDCT ILL					0	0	30	0	30	0	0	0	0	0 4 51 1263
06905	THUNDERBOLT BOWL					0	0	35	0	35	0	0	0	0	0 2 55 0270
06906	ADDITION TO LIBRARY N T PROS PE CT ILLINOIS					0	0	0	9	9	0	0	0	0	0 3 26 1263
06910	ST PAUL LUTHER CHURCH 100 S S CH OOL MT PROS					0	0	93	0	93	0	0	0	0	0 4 31 0167
06912	NOVAK PARKER 1016 E N ORTHWE ST MT PROSP					0	120	0	0	120	0	0	0	0	0 4 53 0169
06924	MEESKES FOOD 101 S MA IN ST MT PROSPECT					0	0	76	0	76	0	0	0	0	0 4 52 0169
06925	MT PROSPECT STATE BAN K 15 & US SD MT PROSP					0	0	0	497	497	0	0	0	0	0 4 55 0169
MCD	PLACE	RSAC 4121 SLA 0965													
07001	TRINITY METHODIST CH 693 GO LF MT PROSPEC					0	0	14	7	21	0	0	0	0	0 4 31 0169
07003	WESTBROOK SCH 103 BUS SE RD MT PROSPECT					0	565	0	0	0	0	0	0	0	0 3 21 0169
07004	FREE STATION MO2 1601 W GOL F MT PROSPECT					0	0	60	0	60	0	0	0	0	0 3 49 1066
07005	BARWOOD TERRACE 700 DEMPS TE R MT PROSPE					0	277	0	0	277	0	0	0	0	0 4 11 0169
07006	BARWOOD TERRACE 708 DEMPS TE R MT PROSPE					0	277	0	0	277	0	0	0	0	0 4 11 0169
07007	BARWOOD TERRACE 718 DEMPS TE R MT PROSPE					0	277	0	0	277	0	0	0	0	0 4 11 0169
07008	BARWOOD TERRACE 724 DEMPS TE R MT PROSPE					0	277	0	0	277	0	0	0	0	0 4 11 0169
07009	BARWOOD TERRACE 732 DEMPS TE R MT PROSPE					0	277	0	0	277	0	0	0	0	0 4 11 0169
07010	BARWOOD TERRACE 740 DEMPS TE R MT PROSPE					0	277	0	0	277	0	0	0	0	0 4 11 0169
07011	BARWOOD TERRACE 748 DEMPS TE R MT PROSPE					0	277	0	0	277	0	0	0	0	0 4 11 0169
07012	BARWOOD TERRACE 756 DEMPS TE R MT PROSPE					0	277	0	0	277	0	0	0	0	0 4 11 0169
07013	ST JOHN LUTHER SCH 1100 LINNE MA N MT PROSPE					0	0	166	0	0	0	0	0	0	0 4 51 0169
07014	MELSON BLDG RT83 RT58 MT PR OS PCT ILL					0	0	92	0	92	0	0	0	0	0 4 51 0169
07015	MT PROSPECT BIBLE CH 503 GO LF MT PROSPEC					0	0	55	0	55	0	0	0	0	0 4 31 0169

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A01

## NCS - Summary

	(6) FALL-OUT SHELTER				(7) BLAST SHELTER				(8) CRP SURVEY	
	(a) FACIL	(b) CAT 0-1 SPACES	(c) P F CAT 2-3 SPACES	(d) P F CAT 4+ SPACES	(e) BSMT SPACES	(a) FACIL	(b) FLR 1-3 SPACES	(c) BSMT SPACES	(a) FACIL	(b) CONG CARE SPACES
(9) TOT FACILITIES AND SPACES	9135	634515	3065323	5132267	1558299	7	21030	6860	0	0
(10) FACILITIES WITHOUT SHELTER	0	0	0	0	0	0	0	0	0	0
(11) FAC W/PF CAT 2+ SPACES	8187	612638	3065323	5132267	1548881	4	6060	5640	0	0
(12) FAC W/PF CAT 2+ (50+ SPACES)	5254	607762	3022042	5105584	1479883	4	6060	5640	0	0
(13) FAC W/PF CAT 4+ SPACES	4979	479549	2507388	5132267	1344922	2	4890	1900	0	0
(14) FAC W/ONLY PF 0-1 SPACES	48	21877	0	0	9418	3	14970	1220	0	0
(15) FAC W/ONLY PF CAT 2+ SPACES	7451	0	2269501	4555513	1320082	0	0	0	0	0
(16) FAC W/ONLY PF CAT 4+ SPACES	2755	0	0	1186548	610002	0	0	0	0	0
(17) FAC W/BSMT (BSMT SPACES ONLY)	5369	9834	202980	580495	793309	1	680	260	0	0
(18) FAC W/ONLY BLAST SPACES	0	0	0	0	0	0	0	0	0	0
(19) FACILITIES LICENSED	3621	344312	1608263	2736466	811871	0	0	0	0	0
(20) FACILITIES POSTED	2578	207923	1223703	1881237	619691	0	0	0	0	0
(21) USE CLASS GROUPINGS										
(a) RESIDENTIAL	2839	182718	987709	822042	207390	0	0	0	0	0
(b) EDUCATIONAL	1065	139381	324921	366322	249701	4	18880	5975	0	0
(c) RELIGIOUS	475	8367	46744	47096	49888	0	0	0	0	0
(d) GVT-PUBLIC SERVICE	701	68189	298968	483353	173667	2	980	260	0	0
(e) COMMERCIAL	2850	162908	1098124	2562985	469069	1	1170	625	0	0
(f) INDUSTRIAL	737	63241	332603	510286	141493	0	0	0	0	0
(g) AMUSEMENT-MEETING	236	2781	18010	33239	30136	0	0	0	0	0
(h) TRANSPORTATION	153	5566	50179	289333	225108	0	0	0	0	0
(i) OTHER	79	1364	8065	17612	11847	0	0	0	0	0
(22) OWNERSHIP										
(a) FEDERAL GVT	96	10523	96566	200071	36740	0	0	0	0	0
(b) STATE GVT	126	31784	75780	79837	56972	1	4890	1500	0	0
(c) LOCAL GVT	1153	180764	429869	555094	384686	5	14970	4735	0	0
(d) PRIVATE-OTHER	7760	411444	2463108	4297265	1080901	1	1170	625	0	0
(23) SPECIAL FACILITIES										
(a) MINES	0	0	0	0	0	0	0	0	0	0
(b) CAVERNS-CAVES	1	0	816	206	365	0	0	0	0	0
(c) TUNNELS-SUBWAYS-UNDERPASSES	49	345	2067	37427	39400	0	0	0	0	0
(d) OTHER	49	692	9252	163728	149923	0	0	0	0	0
(24) MILITARY FACILITIES										
(a) ARMY	2	0	0	1145	0	0	0	0	0	0
(b) NAVY	5	2380	375	5623	7098	0	0	0	0	0
(c) AIR FORCE	0	0	0	0	0	0	0	0	0	0
(d) ERDA, NASA, NSA, ETC.	0	0	0	0	0	0	0	0	0	0

(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)	(37)	(38)	(39)	(40)	(41)	(42)	(43)	(44)	(45)	(46)	(47)	(48)	(49)	(50)	(51)	(52)	(53)	(54)	(55)	(56)	(57)	(58)	(59)	(60)	(61)	(62)	(63)	(64)	(65)	(66)	(67)	(68)	(69)	(70)	(71)	(72)	(73)	(74)	(75)	(76)	(77)	(78)	(79)	(80)	(81)	(82)	(83)	(84)	(85)	(86)	(87)	(88)	(89)	(90)	(91)	(92)	(93)	(94)	(95)	(96)	(97)	(98)	(99)	(100)				
CRP	HOST AREA FACILITY LISTING	AS OF SEPT 30, 1978	17	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100														
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① CRP HOST AREA FACILITY SUMMARY AND ANALYSIS REPORT									
② AS OF SEPT 30, 1978									
③ ---UPGRADABLE SHELTER---									
④ ---UPGRADABLE SHELTER---									
⑤ ---NSS FALLOUT SHELTER---									
⑥ CRP									
⑦ CONG CARE SPACES									
⑧ FACILITIES WITH BASEMENT SPACES SOIL-YDS									
⑨ TOTAL									
⑩ SPECIAL FACILITIES									
⑪ USE CLASSIFICATION									
⑫ OWNERSHIP									
⑬ UTILITIES									
⑭ ACCOMMODATIONS									
⑮ DINING FACILITIES									
⑯ OTHER									
⑰ TOTAL									
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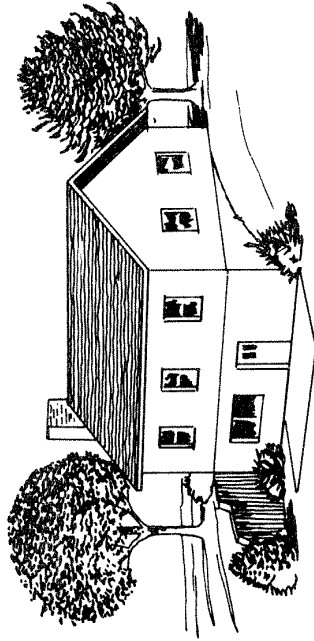
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PAGE 11301

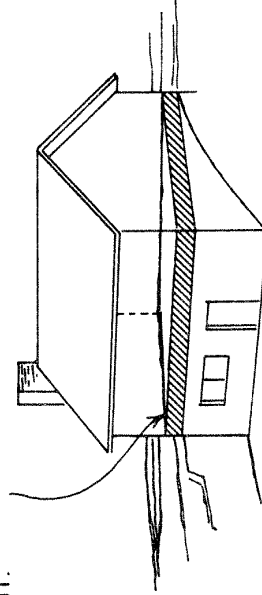
## APPENDIX D

### Illustrations of Shelter Upgrading Techniques

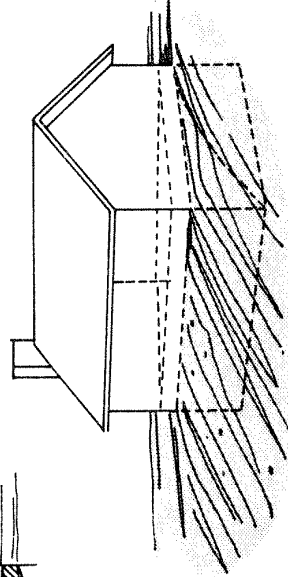
# fallout protection for homes with basements (partially belowground)



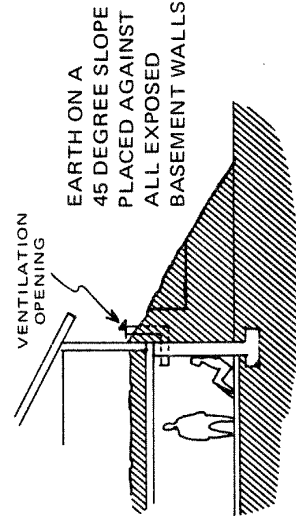
STEP ONE — PROVIDE OVERHEAD BARRIER BY PLACING 12" OF EARTH ON ROOF OR ON FLOOR OVER BASEMENT.



EARTH PILED AGAINST EXPOSED BSMT WALLS



STEP TWO — IMPROVE VERTICAL BARRIER BY PLACING EARTH AGAINST ALL EXPOSED BASEMENT WALLS. COVER WINDOWS IN BASEMENT WALLS WITH WOOD TO PREVENT GLASS BREAKAGE DUE TO EARTH PRESSURE.



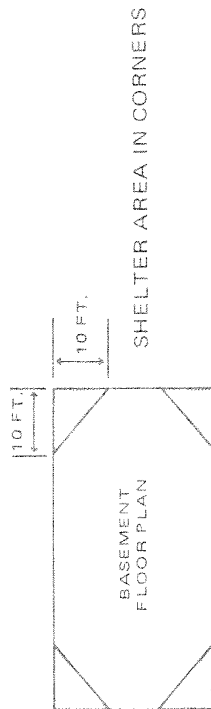
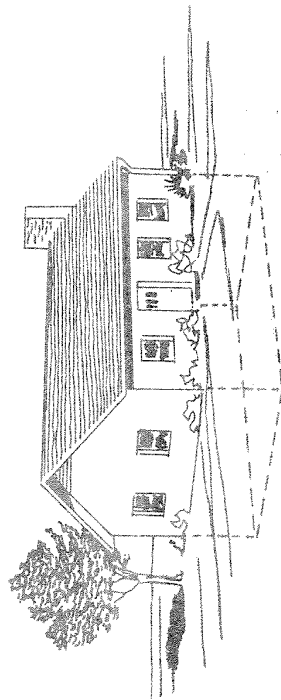
EARTH ON A 45 DEGREE SLOPE PLACED AGAINST ALL EXPOSED BASEMENT WALLS

HOMES WITH BASEMENTS PARTIALLY BELOWGROUND ALSO HAVE POTENTIAL FOR PROVIDING FALLOUT PROTECTION BUT NOT AS MUCH AS THOSE WITH BASEMENTS COMPLETELY BELOWGROUND.

TO IMPROVE THE FALLOUT PROTECTION IN THE BASEMENT AREA, TWO THINGS MUST BE DONE; (1) PROVIDE AN OVERHEAD BARRIER AND, (2) INCREASE THE BARRIER (THICKNESS) OF THE EXPOSED BASEMENT WALLS. THIS CAN BE ACCOMPLISHED AS SHOWN IN SKETCHES. BOTH STEPS MUST BE TAKEN TO OBTAIN THE FALLOUT PROTECTION. DOING ONLY ONE STEP IS NOT ENOUGH.

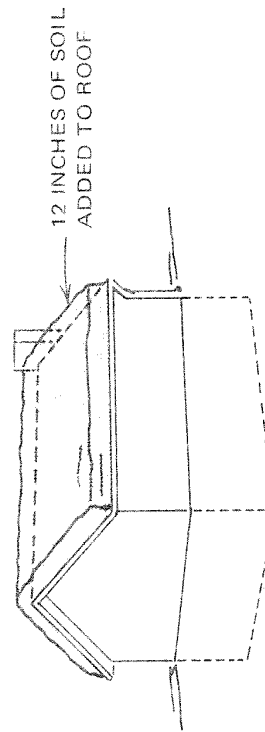
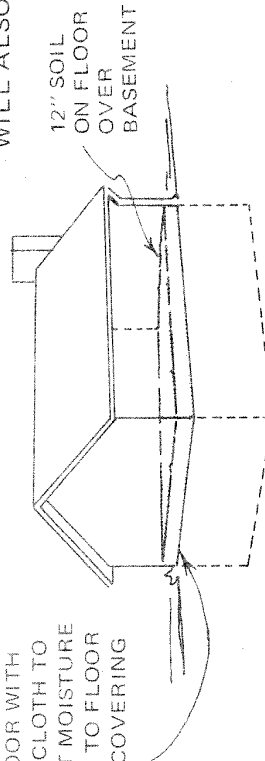
# fallout protection for homes with basements (fully belowground)

HOMES WITH BASEMENTS (COMPLETELY BELOWGROUND) ALREADY HAVE FALLOUT PROTECTION ESPECIALLY IN THE CORNERS OF THE BASEMENT.



THIS PROTECTION CAN BE ENHANCED CONSIDERABLY BY PLACING 12 INCHES OF EARTH OVER THE ENTIRE FLOOR COVERING THE BASEMENT AREA. PLACING EARTH ON THE ROOF OF THE HOME WILL ALSO INCREASE THE FALLOUT PROTECTION.

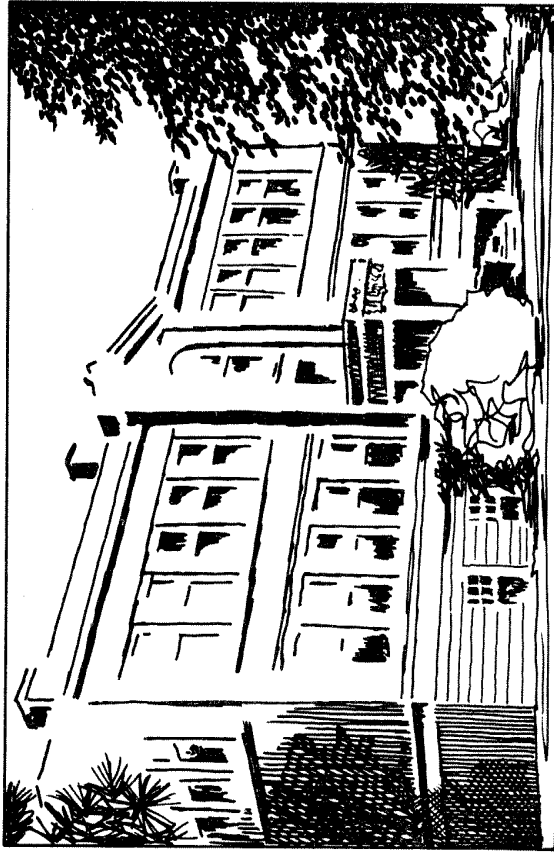
LINE FLOOR WITH PLASTIC CLOTH TO PREVENT MOISTURE DAMAGE TO FLOOR OR RUG COVERING



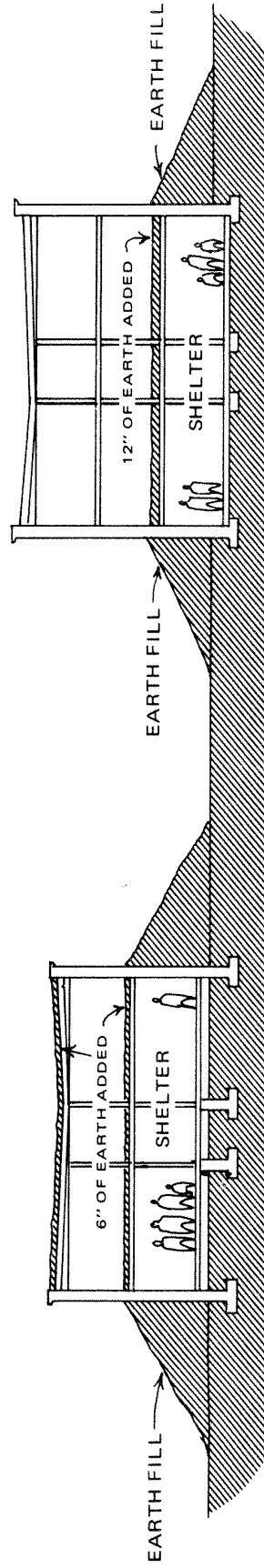
UPGRADING THE BASEMENT SHELTER PERMITS THE ENTIRE BASEMENT AREA TO BE FALLOUT PROTECTED, THUS ALLOWING THE HOMEOWNER TO SHARE THE BASEMENT WITH OTHERS.

REMEMBER: THE MORE MATERIAL YOU ADD THE GREATER THE PROTECTION. A WORD OF CAUTION: PLACING MORE THAN 12 INCHES OF EARTH ON FLOOR OR ROOF WITHOUT PROVIDING ADDITIONAL SHORING MAY CAUSE JOISTS TO SAG EXCESSIVELY AND FAIL.

# fallout protection in school buildings

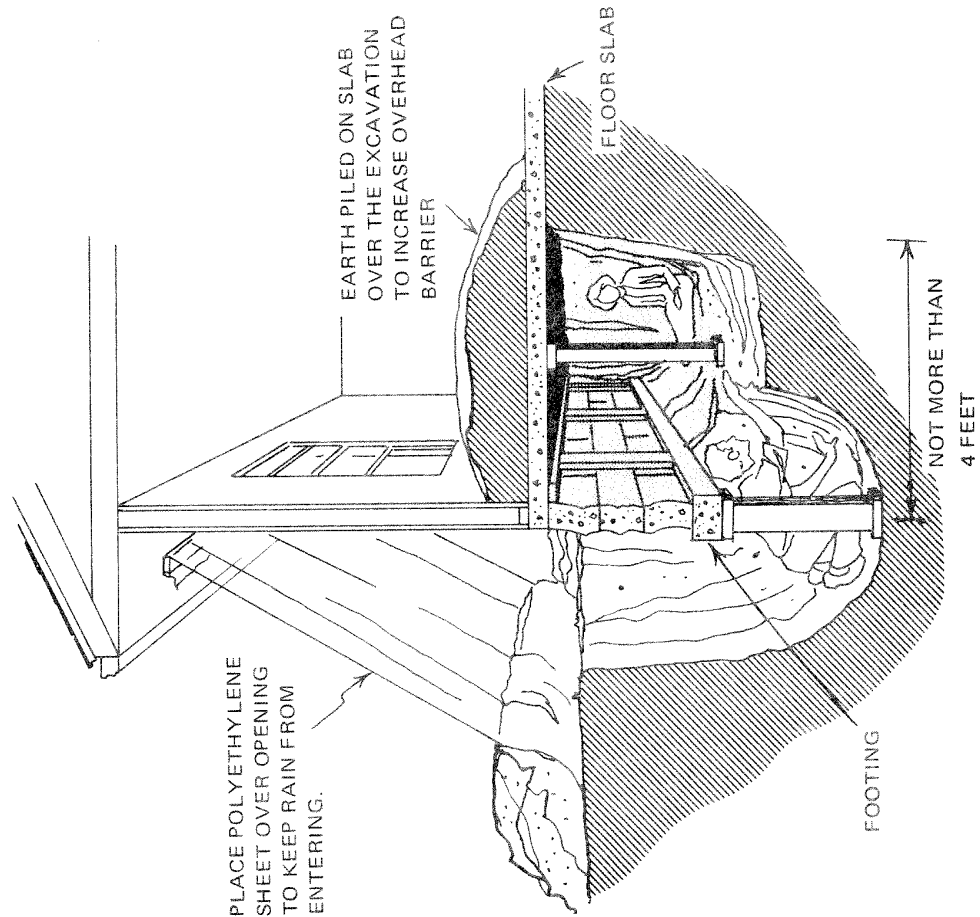


EXISTING SCHOOL BUILDINGS CAN SERVE AS CONGREGATE CARE FACILITIES FOR RISK AREA EVACUEES. BEST FALLOUT PROTECTION CAN BE FOUND IN INTERIOR CORRIDORS AND ROOMS ON THE LOWEST FLOOR, ESPECIALLY IF THE SCHOOL HAS TWO OR MORE STORIES AND THE EXTERIOR WALLS ARE OF CONCRETE OR MASONRY CONSTRUCTION. FALLOUT PROTECTION CAN BE IMPROVED BY PROVIDING ADDITIONAL VERTICAL AND HORIZONTAL BARRIERS OF EARTH AS SHOWN IN SKETCHES. WINDOWS IN EXTERIOR WALLS THAT ARE TO BE COVERED WITH EARTH SHOULD BE PROTECTED WITH LUMBER OR PLYWOOD SHEETS SO THAT THEY WILL NOT BREAK UNDER THE EARTH FILL.



NOTE:  
ADDITIONAL VENTILATION WILL BE REQUIRED SEE DESIGN OF AIR VENTILATION PUMP

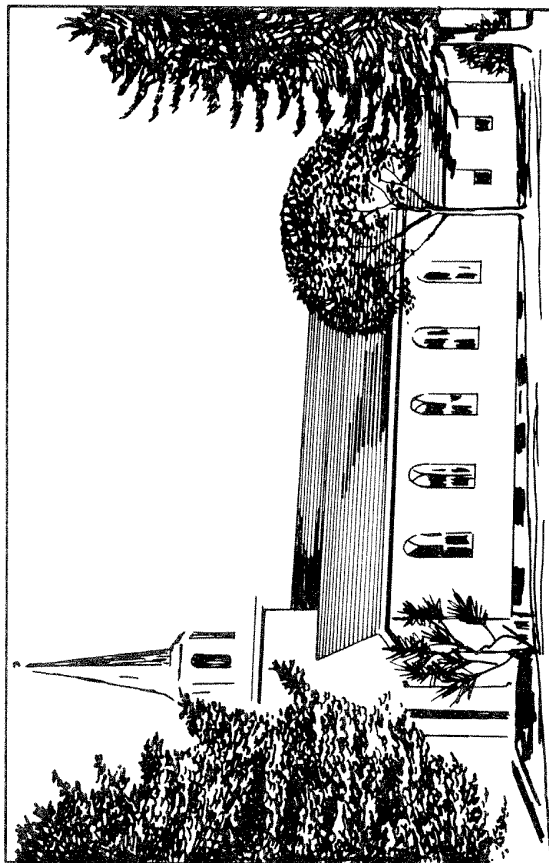
# fallout protection for homes without basements



IN ORDER TO PROVIDE EXPEDIENT FALLOUT PROTECTION TO HOMES WITHOUT BASEMENT, ONE APPROACH IS TO EXCAVATE BENEATH THE FLOOR SLAB AS DEPICTED IN THE SKETCH. BEING UNDER AN EAVE WILL, IN MANY CASES, KEEP RAINWATER OUT OF THE TRENCH AND THE SHELTER ENTRY TUNNEL. ONCE THE BOTTOM OF THE FOUNDATION WALL IS REACHED, A TUNNEL IS DUG UNDER THE FOOTING AND THE MATERIAL REMOVED FROM UNDERNEATH THE SLAB TO CREATE THE SHELTER. THE SHELTER IS OFFSET FROM THE TRANCH SO THAT THE SHELTER WALL IS NOT EXPOSED ON THE OUTSIDE. THE "HOLLOWED-OUT" SHELTER AREA CAN VARY IN SIZE, BUT IT SHOULD NOT EXTEND MORE THAN 4 FEET FROM THE FOUNDATION WALL.

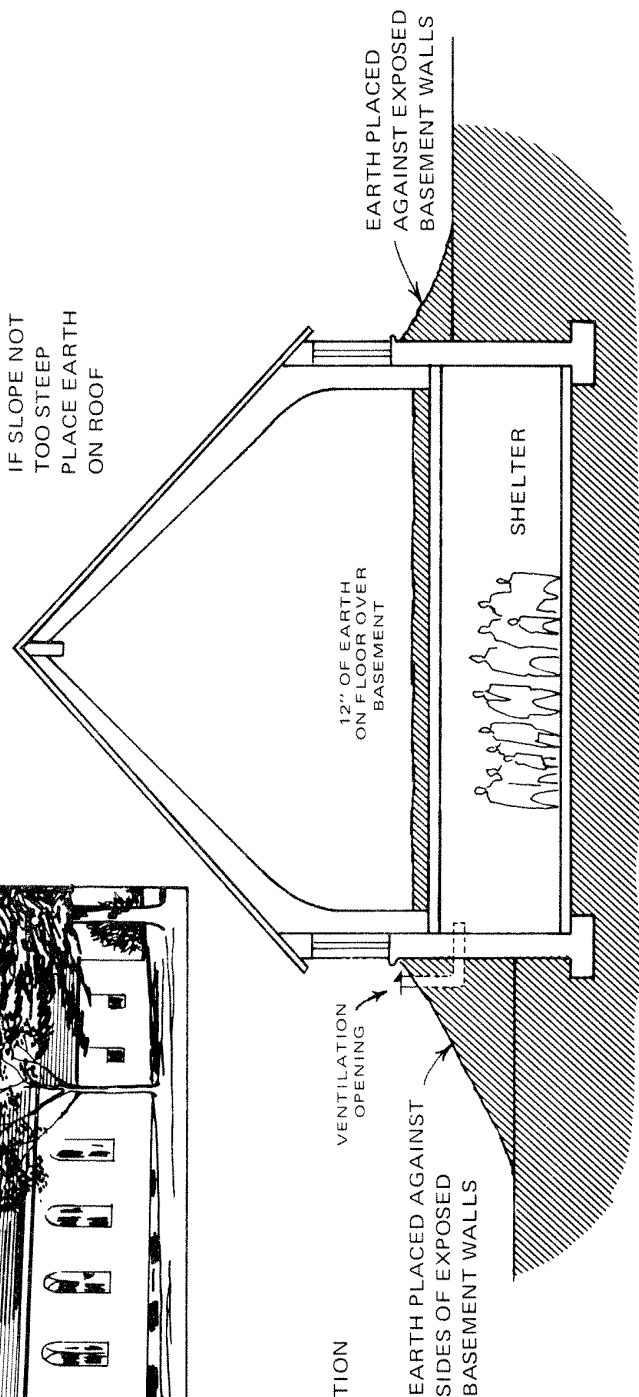
IT IS EXPECTED THAT A TYPICAL SIZE FOR A 4-PERSON SHELTER MIGHT BE 4 FT. DEEP, 4 FT. HIGH, AND 6 TO 8 FT. LONG. SOME OF THE DIRT FROM THE TRENCH CAN BE PILED ON THE SLAB OVER THE SHELTER AND ALSO AGAINST ANY EXPOSURE AT THE TOP OF THE FOUNDATION WALL. ALTHOUGH THE EAVE WILL HELP TO KEEP RAIN OUT OF THE TRENCH, IT WOULD PROBABLY BE WELL TO STRETCH A SHEET OF POLYETHYLENE FROM THE ROOF TO THE OUTER EDGE OF THE DIRT PILE. THIS WOULD HELP TO ASSURE RAINWATER NOT ENTERING THE SHELTER TUNNEL.

# fallout protection in churches



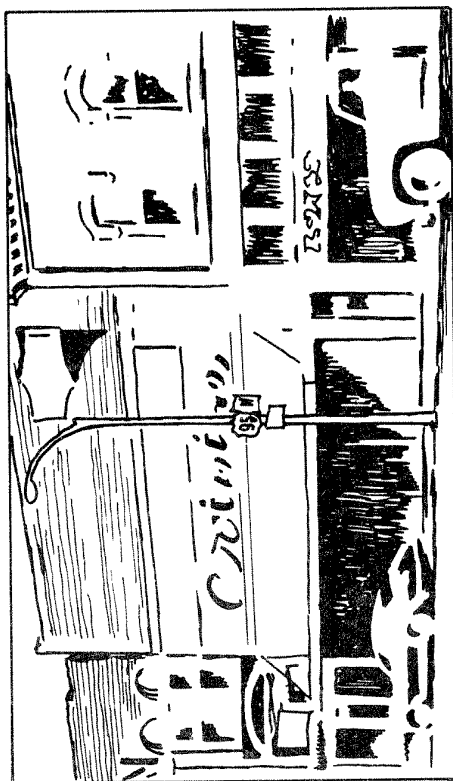
EXISTING CHURCH BUILDINGS CAN SERVE AS CONGREGATE CARE FACILITIES FOR RISK AREA EVACUEES. BEST PROTECTION CAN BE FOUND IN THOSE BUILDINGS THAT HAVE MASONRY EXTERIOR WALLS AND BASEMENTS. SHELTER IN THE BASEMENT AREAS CAN BE IMPROVED BY PLACING 12 INCHES OF EARTH ON THE FLOOR OVER THE BASEMENT AND BY MOUNDING EARTH AGAINST THE EXPOSED BASEMENT WALLS. EARTH CAN ALSO BE ADDED TO THE ROOF PROVIDED THE SLOPE IS NOT TOO STEEP.

IF SLOPE NOT  
TOO STEEP  
PLACE EARTH  
ON ROOF



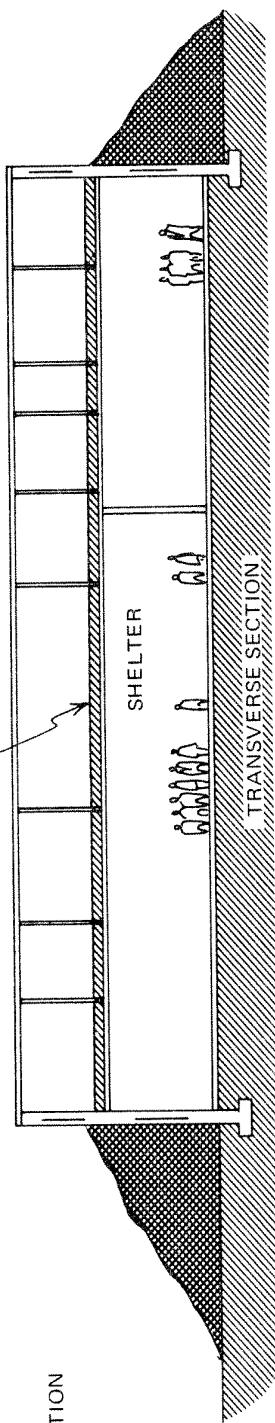
NOTE:  
ADDITIONAL VENTILATION  
WILL BE REQUIRED.  
SEE DESIGN OF AIR VENTILATION  
PUMP

# fallout protection in typical downtown row-type buildings



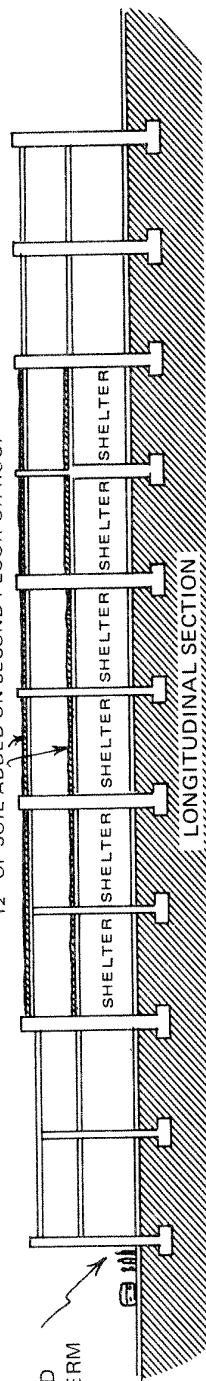
TWO-STORY BUILDINGS IN A ROW GROUPING (NO SEPARATION BETWEEN BUILDINGS) CAN HAVE THE EXISTING FALLOUT PROTECTION IMPROVED CONSIDERABLY IN THE "INTERIOR" SECTIONS BY PLACING EARTH AT THE FRONT AND REAR OF THE BUILDINGS AS WELL AS ON THE FLOOR OVER THE FIRST STORY AND/OR THE ROOF AS SHOWN IN THE SKETCHES. THE TWO BUILDINGS AT EITHER END OF THE ROW SHOULD NOT BE USED FOR SHELTER PURPOSES SINCE THEY PROVIDE SHIELDING FOR THE "INTERIOR" SECTIONS. GLASS FRONTS SHOULD BE PROTECTED FROM BREAKAGE WITH WOOD OR PLYWOOD PANELS.

12" OF SOIL ADDED ON SECOND FLOOR OR ROOF



NOTE:  
ADDITIONAL VENTILATION  
WILL BE REQUIRED.  
SEE DESIGN OF AIR  
VENTILATION PUMP

12" OF SOIL ADDED ON SECOND FLOOR OR ROOF



END STORES  
CAN BE UPGRADED  
BY PROVIDING BERM  
ON END WALLS



# mines, caves and tunnels...



... ARE ANOTHER RESOURCE FOR PROVIDING FALLOUT SHELTER. WHILE MOST OF THIS RESOURCE IS NOT LOCATED WITHIN OR NEXT TO MAJOR METROPOLITAN AREAS, IT IS CLOSE ENOUGH TO BE REACHED BY CITY DWELLERS. MINES, CAVES AND TUNNELS EXIST AND ARE IN COMMERCIAL USE IN SUCH PLACES AS KANSAS, MISSOURI, PENNSYLVANIA, VIRGINIA, UTAH, AND MONTANA. THE MAJOR PROBLEM IN GETTING THESE FACILITIES READY FOR PEOPLE TO USE THEM AS SHELTERS IS LIGHTING AND VENTILATION. TESTS CONDUCTED IN A LIMESTONE MINE NEAR DOWNTOWN KANSAS CITY INDICATED THAT EMERGENCY GENERATORS WOULD BE REQUIRED TO PROVIDE POWER FOR LIGHTING AND OPERATING THE VENTILATION EQUIPMENT IN THE MINE. A LOCAL CONTRACTOR WAS ABLE TO INSTALL LIGHT AND POWER OUTLETS AT DESIGNATED LOCATIONS IN THE MINE, IN ACCORDANCE WITH A PRE-DESIGNED LAYOUT IN A SHORT PERIOD OF TIME.

LARGE FANS (5 FT. DIAMETER, 60,000 CFM) ARE NEEDED AT THE ENTRANCES TO IMPROVE VENTILATION. THOSE MINES WITH DOUBLE ENTRANCES (TWO ALONGSIDE EACH OTHER AS OPPOSED TO THOSE WITH ENTRANCES AT OPPOSITE ENDS OF THE MINE) REQUIRE CONSTRUCTION OF SPECIAL DUCTING TO PREVENT AIR FROM "SHORT CIRCUITING" BETWEEN ENTRY WAYS. A DIVIDING WALL FORMED BY COVERING WOODEN FRAMES WITH POLYETHYLENE SHEETS, IS NEEDED TO SEPARATE THE TWO ADJOINING ENTRANCES. WITH THIS DUCTING ARRANGEMENT, THE EXHAUST FANS EXPEL AIR ON ONE SIDE OF THE DIVIDER WALL WHILE FRESH AIR IS DRAWN INTO THE MINE THROUGH THE ENTRANCE ON THE OTHER SIDE OF THE WALL.

SMALL MINES, IF HABITABLE, OR IF THEY CAN BE MADE HABITABLE IN A CRISIS, SHOULD BE INCLUDED IN CRP PLANNING IF THERE IS AN INSUFFICIENT NUMBER OF UPGRADABLE BUILDINGS TO OVERCOME THE SHELTER DEFICIT.

ANY MINES CONTAINING DANGEROUS GASES, HARMFUL BACTERIA, OR EXTENSIVE WETNESS, SHOULD NOT BE USED. ALTHOUGH CAVES AND TUNNELS CONSTITUTE ONLY A SMALL PERCENTAGE OF THE AVAILABLE UNDERGROUND SPACE, THEY TOO SHOULD BE INCLUDED IN THE PLANNING WHERE AVAILABLE AND THE SPACE IS NEEDED.

## Appendix E

### Use of Large Vehicles in CRP

### Use of Large Vehicles in Crisis Relocation Planning \*

Highway transportation must be fully and effectively exploited to accomplish timely relocations of large metropolitan risk area populations. To that end, this supplement is addressed to the NCP planner as a guideline for the best use of large vehicles during a crisis relocation.

The first step in determining the best use of large vehicles for movement of evacuees (without transportation) in the crisis relocation plan is to calculate the available resources -- the number of buses, truck-tractors and semitrailers, and commercial trucks of intermediate and large size available in the risk area. The breakdown of these vehicles into capacity classes, can be accomplished by studying State and county registration statistics for trucks of all kinds and State-level breakdowns of commercial vehicles by type and weight. A table similar to the one presented in Figure 1 can be developed to indicate the total number of vehicles of each type and the number assumed to be available for crisis relocation service.

#### Capacities

Intercity, suburban, urban, and large school buses can be assumed to carry 50 adults and children plus 2,500 lbs. of luggage. Intermediate buses have half that capacity. There are a variety of arrangements that can be employed to accommodate passengers and their luggage. For example, assume that about 20% of the passengers will be under the age of 12 and can double up in seats -- resulting in a need for only 9 seats for every 10 passengers. Intercity

\*This material was excerpted and adapted from Crisis Relocation of the Population at Risk in the New York Metropolitan Area, prepared for the Defense Civil Preparedness Agency by Clark Henderson and Walmer P. Strobe, Stanford Institute, Menlo Park, CA., October 1977.

Table 1  
 AVAILABILITY OF BUSES AND TRUCKS  
 RISK AREA COUNTIES

	Estimated Total	Assumed Usable for Relocation Service
Buses		
Large		
Intermediate		
Truck-Tractors and Semitrailers		
Trucks		
Intermediate (over 20,000 lb)		
Small (10,000-19,900 lb)		
Pickups, vans, etc. (to 9,999 lb)		

buses have luggage space below the passenger deck and about 45 seats. Most suburban and urban buses have 40-ft. bodies with about 50 seats and baggage can be carried in empty seats and in aisles. Large school buses typically have seats for about 65 students and, again, luggage can be carried in seats and aisles.

Tractor-trucks and semitrailers are assumed to carry 50 passengers plus luggage -- the same number of passengers as a large bus. A 40-ft. semitrailer has about 300 sq. ft of floor space and will provide about 6 sq. ft. of space per passenger and luggage.

Small buses and intermediate trucks with 20-ft. cargo boxes will have about half the capacity of a large bus or tractor-truck and trailer -- that is, they should be able to carry 25 passengers and luggage.

### Productivity

Buses and trucks can achieve their best productivity by making several round trips. The next step, then, is to compute cycle times. Assume, for example, that the operating speeds of vehicles on highways are: 40 mph on controlled highways, 35 mph on uncontrolled highways and 30 mph on feeder and distribution ramps.

Although Table 2 represents a base solution developed for New York City, the data contained in the first five columns of the table can also be utilized in other areas. Adjustments can be made to the values shown to reflect actual conditions if different from the assumptions made. In the New York City base solution, using only freeways, planners estimated that a flow of approximately 586 large vehicles per hour would be needed to transport 1,758,500 carless persons in a three-day period. (Other carless people are transported by non-highway modes.)

The number of large vehicles needed to maintain this flow of 586 vehicles per hour was then estimated for various distances between origins and destinations. In calculating the number of vehicles required, the planners assumed that the travel speed of large vehicles is 40 mph on the freeway(s) and 30 mph on local feeder and distribution routes in risk and host areas. They also assumed that the travel distance of large vehicles

Table 2

## NUMBER OF LARGE VEHICLES NEEDED

Miles	Round Trip Travel Time on Freeway (hr)	Round Trip Travel Time on Local Routes (hr)	Standing Time * (hr)	Cycle Time (hr)	Average Number of Outbound Trips in Three Days	Total Number of Vehicles Needed
100	4.25	1.0	1.0	6.25	7.2	4,880
150	6.75	1.0	1.5	9.25	4.86	7,240
200	9.25	1.0	2.0	12.25	3.67	9,580
250	11.75	1.00	2.5	15.25	2.94	11,960
300	14.25	1.00	3.0	18.25	2.46	14,300

\* Includes loading, unloading, rest time for drivers, and the like.

Assumes vehicles are in duty cycle for 45 hr in three days.

Assumes that 35,170 vehicles must be dispatched in three days.

General Equation:

Total No. of vehicles needed =  $\frac{\text{No. of carless persons to be evacuated}}{\text{Vehicles capacity (persons per vehicle) average no. of outbound trips in three days.}}$

to and from the freeway(s) is 15 miles at each end. The total standing or idle time in one round trip was assumed to vary from one hour for a 100-mile trip to three hours for a 300-mile trip. Standing or idle time was defined as the time used for passenger loading, unloading, rest stops, and other delays in the duty cycle.

#### Numbers of Vehicles Required

In the base solution for New York City, portrayed in Table 2, it can be seen that maintenance of the flow rate of 586 vehicles per hour for an average of 20 hours each day for three days will require dispatching 35,170 loaded vehicles. It is assumed that each vehicle can be kept in the duty cycle an average of 15 hours during each 24 hour period and will be kept out of service the remainder of the time. Thus, if average cycle time per round trip were 9 hours, the average vehicle would make five deliveries and the required fleet would contain 7,034 vehicles. Vehicle requirements for distance of 100 to 300 miles are presented in Table 2.

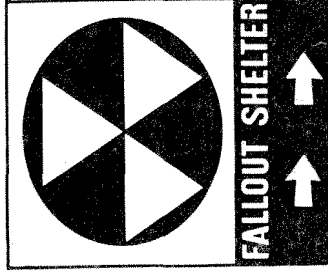
The procedures illustrated in Table 2 can be adapted for any jurisdiction enabling the planner to develop the best use of large vehicle in a crisis relocation.

## Appendix F

### Typical Expedient Shelter Designs



# These are PLANS FOR EXPEDIENT FALLOUT SHELTERS



## SAVE THESE PLANS—THEY MAY SAVE YOUR LIFE

### • GENERAL INFORMATION

WITHOUT PROTECTION, UNTOLD NUMBERS OF AMERICANS WOULD DIE NEEDLESSLY IN THE EVENT OF A NUCLEAR ATTACK. THE EXPEDIENT SHELTERS ILLUSTRATED IN THE FOLLOWING PAGES PROVIDE PROTECTION TO OCCUPANTS FROM THE DEADLY RADIATION OF RADIOACTIVE FALLOUT GENERATED BY A NUCLEAR DETONATION — THEIR USE CAN SAVE THE LIVES OF MILLIONS OF AMERICANS.

EVEN THOUGH THE ILLUSTRATED SHELTERS ARE VERY AUSTERE, THERE ARE A NUMBER OF THINGS THAT CAN BE DONE TO IMPROVE THEIR HABITABILITY AFTER THEY HAVE BEEN BUILT. WITH THE USE OF A LITTLE INGENUITY AND EFFORT, THE SHELTERS CAN BE MADE MORE COMFORTABLE. SOME OF THE THINGS THAT CAN BE DONE ARE:

- CONSTRUCT SEATS, HAMMOCKS, OR BUNKS.
- COVER THE FLOOR WITH BOARDS, PINE BOUGHS OR LOGS AND DRAPE SHEETS OR MATERIAL OVER THE EARTH WALLS.
- PROVIDE SAFE, DEPENDABLE LIGHT.
- FOR HOT WEATHER, CONSTRUCT THE EXPEDIENT AIR VENTILATION PUMP.
- <sup>FOR COOKING,</sup> CONSTRUCT THE EXPEDIENT COOK STOVE FOR USE IN THE ENTRYWAY. IN COLD WEATHER, SEAL THE ENTRANCE AND USE THE STOVE FOR HEATING THE SHELTER AREA. BE SURE VENTILATION IS PROVIDED WHENEVER THE STOVE IS USED.
- STORE SHELTER SUPPLIES IN ENTRYWAY FOR MORE LIVING SPACE. COVER ALL OPEN CONTAINERS. RADIATION WILL NOT DAMAGE THESE SUPPLIES.

HUMANS MUST HAVE WATER AND FOOD TO LIVE. WHEN PEOPLE ARE TO LIVE IN A SHELTER FOR A WEEK OR TWO, SUFFICIENT FOOD AND SUPPLIES MUST BE PROVIDED FOR THE OCCUPANTS. THE MINIMUM NECESSITIES ARE:

- WATER — MINIMUM REQUIREMENTS (DEPENDENT UPON TEMPERATURE — LESS IN

COLD WEATHER, MORE IN WARMER) WILL BE FROM ONE QUART TO ONE GALLON PER PERSON PER DAY. STORAGE CAN BE ACCOMPLISHED BY USING DISINFECTED METAL OR PLASTIC TRASH CANS OR BOXES LINED WITH STRONG POLYETHYLENE FILM OR STRONG PLASTIC BAGS. FOR PURITY, EIGHT DROPS (ONE TEASPOON) OF A 5-% CHLORINE SOLUTION (e.g., CLOROX) SHOULD BE MIXED INTO EACH 5 GALLONS OF WATER.

- FOOD — ALL FOOD SHOULD REQUIRE NO REFRIGERATION AND SHOULD BE BROUGHT TO THE SHELTER IN AIRTIGHT TINS OR BOTTLES. UNDER SHELTER CONDITIONS, PEOPLE WILL REQUIRE ABOUT HALF AS MUCH FOOD AS USUAL. FOODS SHOULD HAVE A HIGH NUTRITIONAL VALUE AND A MINIMAL AMOUNT OF BULK (i.e., CANNED MEATS — FRUITS — VEGETABLES, DRIED CEREALS, HARD CANDY, ETC.)

- SANITATION — A METAL CONTAINER WITH A TIGHT-FITTING LID FOR USE AS A TOILET WITH WHICH PLASTIC BAGS CAN BE USED. TOILET PAPER, SOAP, TOWELS, SANITARY ITEMS AND A QUANTITY OF STRONG PLASTIC BAGS WILL BE NEEDED.

- MEDICAL SUPPLIES — A WELL-STOCKED FIRST-AID KIT COMPARABLE TO WHAT IS USUALLY KEPT AT HOME. TAKE SPECIAL MEDICINES FOR INFANTS AND OTHERS AND A GOOD FIRST-AID HANDBOOK.

- CLOTHING AND BEDDING — SEVERAL CHANGES OF CLEAN CLOTHING, ESPECIALLY SOCKS AND UNDERCLOTHING — DEPENDENT UPON THE WEATHER, BLANKETS, PILLOWS AND SLEEPING BAGS MAY ALSO BE NEEDED.

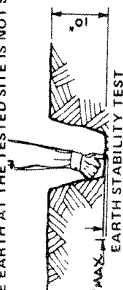
- PORTABLE RADIO — LASTLY, BUT HARDLY LEAST IMPORTANT, A PORTABLE RADIO WITH FRESH AND EXTRA BATTERIES. RADIO STATION BROADCASTS WILL ADVISE YOU WHEN IT IS SAFE TO ABANDON THE SHELTER AND ALSO PROVIDE YOU WITH OTHER IMPORTANT EMERGENCY INFORMATION.

# EXPEDIENT CAR-OVER-TRENCH

GENERAL INFORMATION: READ AND STUDY ALL INSTRUCTIONS BEFORE BEGINNING. IF A BIG STATION WAGON IS USED, SHELTER CAN BE PROVIDED FOR UP TO 6 PERSONS. LESS IF CAR IS SMALLER. SHELTER SHOULD BE BUILT IN AREAS WHERE GROUNDWATER OR ROCK IS CLOSE TO THE GROUND SURFACE. SHELTER CAN BE CONSTRUCTED BY TWO PERSONS WORKING A TOTAL OF ABOUT 8 HOURS EACH.

## STEP 1

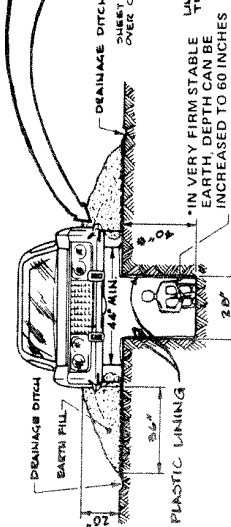
SELECT A LEVEL SITE. DIG A SMALL TEST HOLE ABOUT 10 INCHES DEEP. REMOVE ALL LOOSE EARTH FROM THE BOTTOM. PUSH THE POINT OF YOUR THUMB INTO THE UNDISTURBED EARTH IN THE BOTTOM OF HOLE. IF THE POINT OF YOUR THUMB PENETRATES MORE THAN ONE INCH, THE EARTH SHOULD BE SUITABLE FOR THIS SHELTER. IF THUMB PENETRATES DEEPER THAN ONE INCH, MOVE TO ANOTHER SITE AND REPEAT TEST. BECAUSE EARTH AT THE TESTED SITE IS NOT SUITABLE.



EARTH STABILITY TEST

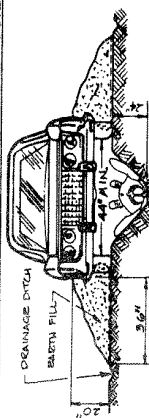
## STEP 2

STAKE OUT DIMENSIONS SHOWN FOR TRENCH AND ENTRYWAY. NOTE THAT THE LENGTH OF TRENCH MUST BE 4 FEET LESS THAN THE OVERALL LENGTH OF THE CAR.



TRENCH AND FILL DETAIL

## ALTERNATIVE METHOD FOR SANDY SOILS

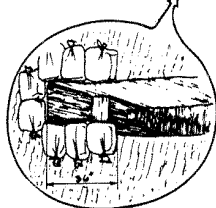


A "SIT IN" SHELTER CANNOT BE DUG IN BEACH TYPE SAND, BECAUSE THE TRENCH WALLS WILL CAVE IN. HOWEVER, A LIE IN TRENCH CAN BE DUG AS SHOWN ABOVE AND STILL PROVIDE GOOD FALL-OUT PROTECTION. ALL OTHER STEPS REMAIN THE SAME.

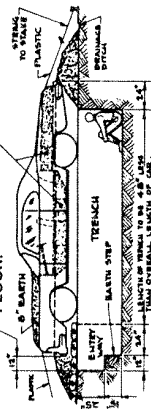
# FALLOUT SHELTER

## TOOLS AND MATERIALS

1. CAR: CAUTION: CAR MUST HAVE AT LEAST 44 INCHES OF WIDTH BETWEEN INSIDE WALLS OF TIRES.
2. PICK AND LONG-HANDLED SHOVEL.
3. PLASTIC SHEETING AND/OR CLOTH APPROX. 10-12 BEDSHEETS OR EQUIV. AREA OF OTHER MATERIALS WHICH ARE SUITABLE FOR TRENCH Lining.
4. SANDBAGS OR PILLOWCASES, 9 REQUIRED.
5. 50 FEET OF STRONG STRING OR CORD AND A KNIFE.
6. YARDSTICK OR MEASURING TAPE
7. WORK GLOVES FOR EACH WORKER.
8. STAKES, 4 REQUIRED.



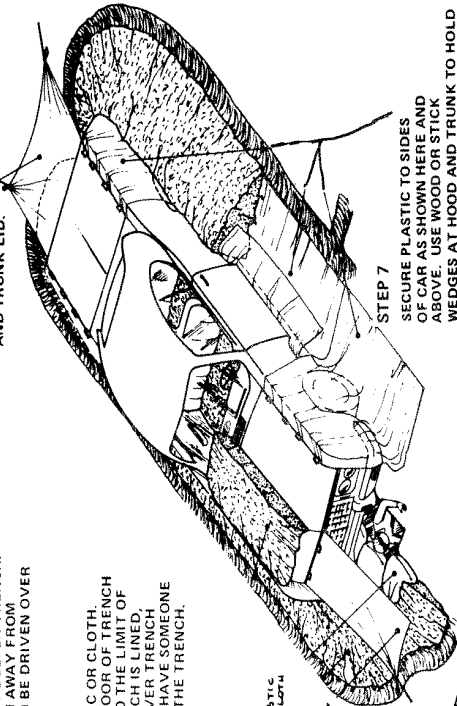
- STEP 5 REMOVE ALL SEATS (IF POSSIBLE). COVER FLOOR AND TRUNK WITH PLASTIC; PLACE 1 FOOT OF EARTH FILL IN TRUNK AND ON FLOOR.



TRENCH AND ENTRYWAY DETAIL

## STEP 6

PLACE PLASTIC COVER OVER ENTRANCE AND VENTILATION OPENINGS. SECURE UNDER HOOD AND TRUNK LID.



## STEP 7

SECURE PLASTIC TO SIDES OF CAR AS SHOWN HERE AND ABOVE. USE HOOD FOR STICK PLACES A HOOD AND TRUNK TO HOLD PLASTIC. ALSO SECURE WITH DOOR AS SHOWN ABOVE.

## STEP 8

BANK EARTH AROUND CAR TO HEIGHT OF 20 INCHES.

## STEP 9

PLACE SANDBAGS AROUND ENTRANCE AND BANK EARTH AROUND THEM.

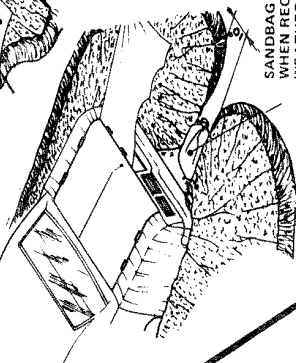
## STEP 10

PLACE 8 INCHES OF EARTH ON CAR HOOD

## STEP 11

DIG SHALLOW DRAINAGE DITCH AROUND FILL.

SANDBAG TO REDUCE AIRFLOW WHEN REQUIRED DURING COLD WEATHER



# EXPEDIENT FALLOUT SHELTER

## TILT-UP DOORS AND EARTH

### GENERAL INFORMATION

READ AND STUDY ALL INSTRUCTIONS BEFORE STARTING TO BUILD. THE LOCATION SELECTED FOR THIS SHELTER SHOULD BE LEVEL OR GENTLY SLOPING DOWN AND AWAY FROM THE MASONRY WALL. A THREE PERSON SHELTER CAN BE COMPLETED BY THREE PEOPLE WORKING A TOTAL OF 6 HOURS EACH.

#### STEP 1

LAY OUT THE TRENCH AND EARTH NOTCH WIDTHS, AS DIMENSIONED ON THE SECTION BELOW. ADJACENT TO A MASONRY WALL. DETERMINE THE LENGTH OF TRENCH AND NOTCH BY ALLOWING ONE DOOR WIDTH OF LENGTH PER PERSON TO BE SHELTERED.

#### STEP 2

EXCAVATE TRENCH AND EARTH NOTCH. PLACE EXCAVATED EARTH OUTSIDE SHELTER LIMITS FOR LATER USE.

#### STEP 3

REMOVE DOOR KNOBS FROM ALL DOORS. PLACE DOUBLE LAYER OF DOORS IN NOTCH AND AGAINST WALL AS SHOWN IN SKETCH. NAIL 1x8 BOARD TO DOOR EDGES AT ENTRANCE TO SERVE AS EARTH STOP. AFTER ATTACHING PLASTIC ENTRANCE COVER AS SHOWN OR BUILD RETAINING WALL OF SANDBAGS OR LINED BOARD. PLACE ONE SAND BAG OR LINED BOARD LENGTHWISE AS THE END CLOSURE.

#### STEP 4

PLACE ONE END OF THE ROLLED UP WATERPROOFING MATERIAL UNDER THE TOP EDGE OF THE DOORS BEFORE EARTH IS PLACED. BEGIN PLACEMENT OF EARTH FILL ON DOORS. COVER THE EARTH FILL WITH WATERPROOFING MATERIAL. SECURING IT WITH EARTH THAT TOP AND BOTTOM TO PREVENT IT FROM BLOWING AWAY.

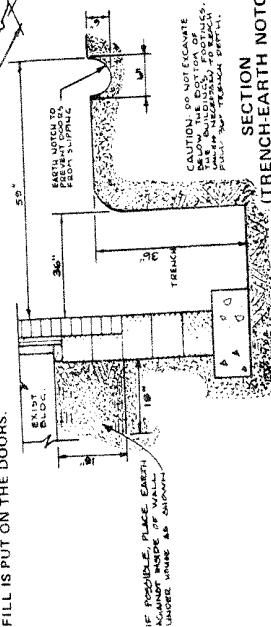
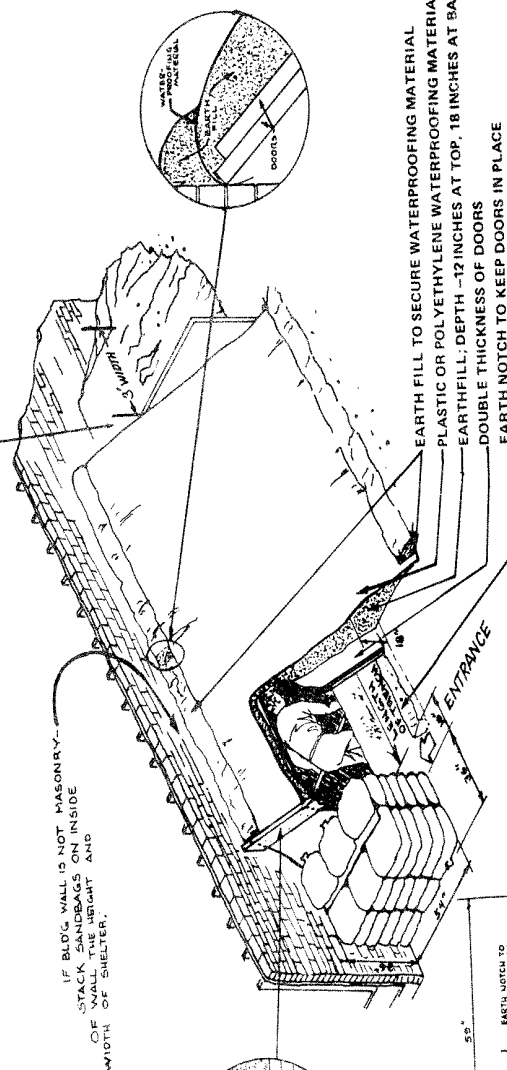
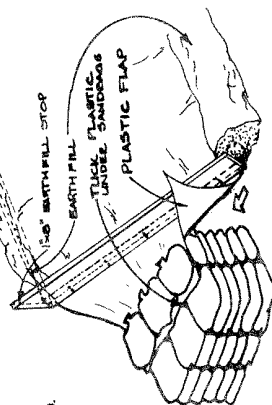
#### STEP 5

CONSTRUCT ENTRANCE - FILL "SANDBAG PILLOW CASES" WITH EARTH TAKEN FROM THE TRENCH AND STACK TO DIMENSIONS SHOWN AFTER DOORS ARE IN PLACE. PLASTIC OR POLYETHYLENE WATERPROOFING MATERIAL ENTRANCE COVER SHOULD BE IN PLACE BEFORE EARTH FILL IS PUT ON THE DOORS.

### TOOLS AND MATERIALS

1. TOOLS: PICK, SHOVEL, HAMMER, SAW, SCREWDRIVER, KNIFE, YARDSTICK.
2. SANDBAGS, PILLOWCASES OR PLASTIC GARBAGE BAGS - AT LEAST 39.
3. LUMBER: 1x8 PLANKS - 7' LONG (OR 20 MORE SANDBAGS) FOR EARTH STOP AT ENTRANCE.
4. EARTH STOP AT ENTRANCE.
5. ROPE OR CORD TO TIE SAND BAGS.
6. DOORS: TWO LAYERS FOR LENGTH OF SHELTER PLUS ONE FOR END CLOSURE. (EXAMPLE: 7 DOORS FOR 3 PERSON SHELTER).
7. NAILS: 8 penny (2 1/2" LONG), ABOUT 10 TO NAIL EARTH STOP TO DOOR EDGES AT ENTRANCE.
8. PLASTIC OR POLYETHYLENE (WATERPROOFING MATERIAL) TO COVER DOUBLE LAYER OF DOORS PLUS ENTRANCE.
9. WORK GLOVES FOR EACH WORKER.

### ENTRY DETAIL



### SECTION (TRENCH-EARTH NOTCH)

# EXPEDIENT FALLOUT SHELTER

## ABOVE-GROUND DOOR-COVERED SHELTER

### GENERAL INFORMATION

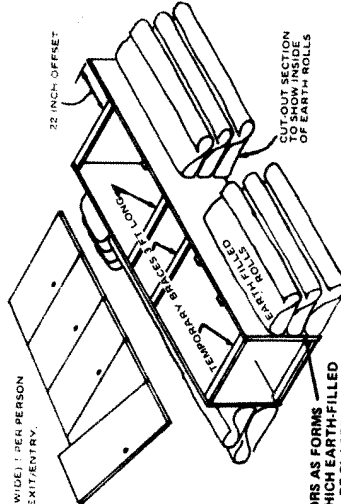
THE ABOVE-GROUND DOOR-COVERED SHELTER IS DESIGNED FOR AREAS WHERE CONSTRUCTION OF AN UNDERGROUND SHELTER BECAUSE OF THE GROUND WATER TABLE OR BEDROCK IS CLOSE TO THE GROUND SURFACE. THIS SHELTER IS TO BE BUILT BY FOUR PERSONS WORKING A TOTAL OF 10 HOURS EACH.

READ AND STUDY ALL INSTRUCTIONS BEFORE STARTING TO BUILD. IF DOOR WIDTHS MEASURE LESS THAN 32 INCHES USE A COMBINATION OF DOORS TO PROVIDE A MINIMUM OF 32 INCHES OF DOOR-WIDTH PER PERSON.

### STEP 1

SELECT A SHELTER LOCATION WHERE THERE IS LITTLE OR NO CHANCE OF RAINWATER PONDING ON THE GROUND SURFACE. STAKE OUT SHELTER, REMOVE DOOR KNOBS. ALLOW 1 DOOR FOR EACH PERSON PLUS 1 DOOR FOR ENTRY/EXIT AT ENCL. LIMIT IS 8 PERSONS PER SHELTER.

DOORS (32" WIDE) 1 PER PERSON PLUS 1 FOR ENTRY/EXIT.

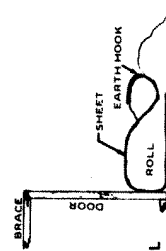


### STEP 2

SET UP DOORS AS FORMS AROUND WHICH EARTH-FILLED ROLLS WILL BE PLACED. NAIL ONLY TOP BRACES. NAILS MUST BE REMOVED LATER. BRACE ALL CORNERS, CENTER, TOP AND BOTTOM OF EACH DOOR.

### STEP 3

BEGIN TO PLACE EARTH-FILLED ROLLS AGAINST DOOR FORMS. TO FORM EARTH ROLLS SEE EARTH-FILLED ROLL DETAIL BOTTOM OF PAGE.

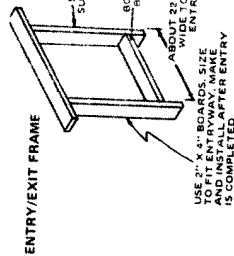


### EARTH-FILLED ROLL DETAIL

1. PLACE 2 FT OF SHEET ON GROUND AND TEMPORARILY DRAPE REMAINDER OF SHEET ON DOOR.
2. PLACE EARTH ON SHEET - SHAPE AS SHOWN.
3. FOLD SHEET OVER SHAPED EARTH.
4. PLACE EARTH ONTO SHEET AT NARROW TRENCH.
5. FOLD SHEET TO FORM EARTH HOOK. HOOK WILL ANCHOR SHEET.
6. REPEAT TO FORM NEXT EARTH-FILLED ROLL.

### TOOLS AND MATERIALS

1. Doors as indicated.
2. Pick or Mattock and Shovel.
3. Two Buckets or Large Cans to Carry Earth.
4. Tape Measure, Yardstick or Ruler.
5. Saw, Axe or Hatchet.
6. Hammer and at least 20 Nails - 2 1/2" long.
7. At least 4 Double Bed Sheets for Each Person.
8. Plastic and Rainproofing Materials such as Plastic Polyethylene.
9. Work Gloves for Each Worker.
10. Lumber for use as Temporary Braces and for Entry/Exit Frame.



USE 2" X 4" BOARDS, SIZE OF DOOR FRAME AND INSTALL AFTER ENTRY IS COMPLETED.

FOLD WATERPROOFING MATERIAL UNDER HIGHER OF DOOR TO KEEP IT FROM SLIPPING.

### STEP 4

KEEP HEIGHT OF EARTH ABOUT EQUAL ON BOTH SIDEWALLS AS ROLLS ARE FORMED. AFTER SIDEWALLS HAVE REACHED PLANNED HEIGHT, REMOVE BRACES AND DOOR FORMS. USE SAME DOOR FORMS TO CONSTRUCT ENDWALLS WITH EARTH FILLED ROLLS. PROVIDE ENTRY/EXIT AT END AS SHOWN.

### STEP 5

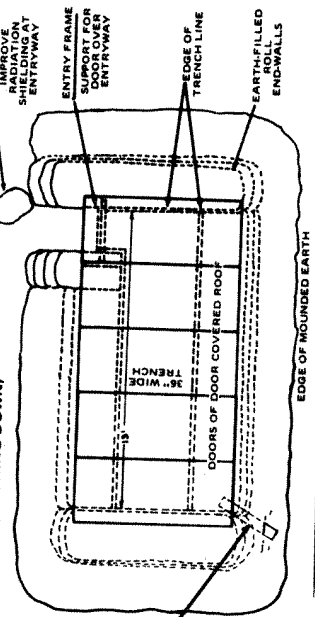
REMOVE DOOR FORMS FROM ENDWALLS. POSITION ROOF DOORS IN THEIR FINAL POSITION. PLACE ENTRY FRAME PORT DOOR OVER ENTRY/EXIT. PLACE WATERPROOFING MATERIAL ON DOORS.

### STEP 6

PLACE 15 INCHES OF EARTH ON TOP OF SHELTER. IN HOT WEATHER CONSTRUCT A SHELTER VENTILATION AIR PUMP. SEE AIR PUMP DETAILS ON LAST PAGE.

NOTE: IF TRENCHING IS IMPRACTICAL HEIGHTEN WALLS BY USING ADDITIONAL EARTH ROLLS.

### PLAN VIEW OF SHELTER (4 PERSON)



# EXPEDIENT FALLOUT SHELTER

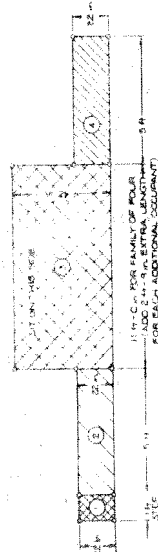
## LOG-COVERED TRENCH SHELTER

### GENERAL INFORMATION

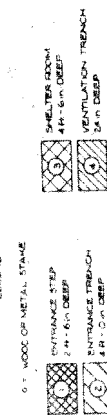
THIS SHELTER IS DESIGNED FOR AREAS WHERE THE DEPTH BELOW THE GROUND SURFACE TO HARD ROCK OR GROUNDWATER IS BELOW THE BOTTOM OF THE TRENCH. ALSO, THE EARTH MUST BE SUFFICIENTLY FIRM AND STABLE SO THAT THE TRENCH SIDEWALLS WILL NOT CAVE IN. IN ADDITION, ADEQUATE SMALL TREES THAT CAN BE CUT FOR LOGS MUST BE AVAILABLE IN THE IMMEDIATE AREA. THE SHELTER (4-PERSON CAPACITY) CAN BE BUILT BY 4 PEOPLE WORKING A TOTAL OF 12 HOURS EACH. AFTER INITIAL COMPLETION, THE SHELTER CAN BE ENLARGED TO A WIDTH OF 5 FT - 6 IN. AND DEEPENED TO 6 FT. HOWEVER, 9-FT LOGS MUST BE USED IN PLACE OF 7-FT LOGS AND THE BURIED ROOF MUST BE LARGE ENOUGH TO COVER THE WIDENED SHELTER DURING THE INITIAL CONSTRUCTION.

### STEP 1

CLEAR AREA OF BRUSH AND TALL GRASS.  
LAYOUT SHELTER AS SHOWN BELOW



### LEGEND

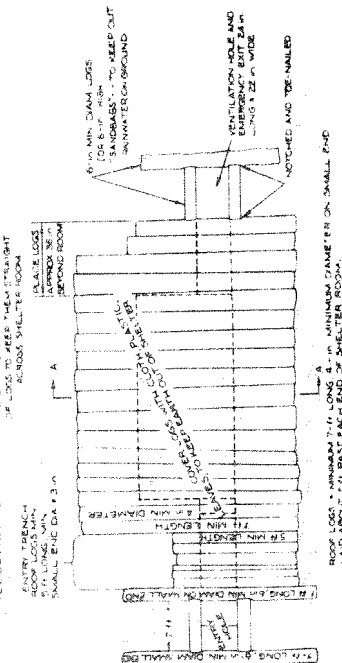


### STEP 2

BEGIN EXCAVATING THE TRENCH. PLACE EXCAVATED EARTH AT LEAST 3 FEET BEYOND THE EDGE OF TRENCH SO THAT THE ROOF LOGS CAN LATER BE PLACED OVER THE TRENCH.

### STEP 3

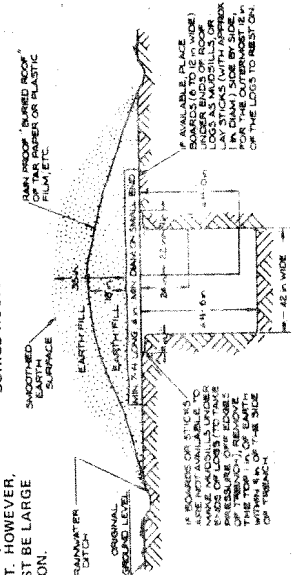
AS THE TRENCH EXCAVATION PROGRESSES, SOME WORKERS SHOULD BEGIN CUTTING LOGS TO THE LENGTH AND SIZE AS SHOWN ON THE ILLUSTRATIONS.



PLAN VIEW OF TOP OF SHELTER

### STEP 4

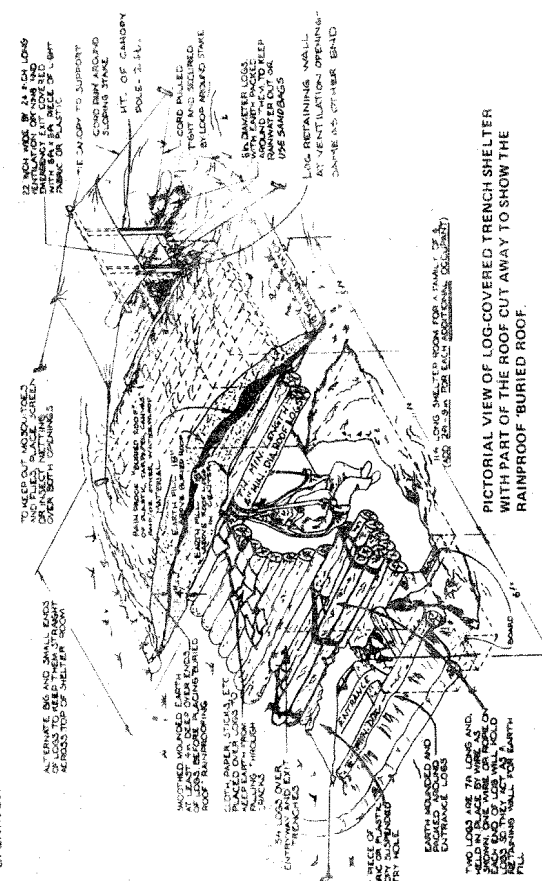
PLACE LOGS OVER TRENCH. POSITION TIES FOR BED, SHEET CHAIRS OR HAMMOCKS. PLACE NEWSPAPER OR OTHER MATERIAL AS INDICATED OVER LOGS. PLACE EARTH FILL AND BURIED ROOF.



### SECTION A-A

### STEP 5

CONSTRUCT CANOPIES OVER THE OPENINGS.



PICTORIAL VIEW OF LOG-COVERED TRENCH SHELTER WITH PART OF THE ROOF CUT AWAY TO SHOW THE RAINPROOF BURIED ROOF.

### TOOLS AND MATERIALS

1. SAW AND/OR AXE.
2. PICK OR MATTOCK.
3. LONG-HANDLED SHOVELS.
4. RAINPROOFING MATERIAL (PLASTIC OR POLYETHYLENE) 25 SQUARE YARDS. FOR EACH PERSON ABOVE 4. ADD 2 SQ YDS.
5. 50 FEET OF STRONG STRING OR CORD.
6. AND A KNIFE.
7. TAPE MEASURE OR YARD STICK.
8. SANDBAGS.
9. WORK KNOTS FOR USE AS "CHAIRS" OR "HAMMOCKS". - 1 PER PERSON PLUS AT LEAST 15 FEET OF STRONG ROPE OR CORD PER BED SHEET.
10. 15 POUNDS OF NEWSPAPERS TO PLACE OVER ROOF LOGS TO KEEP EARTH FROM FALLING THROUGH CRACKS BETWEEN LOGS.

### APPROX. NO. OF POLES REQ'D.

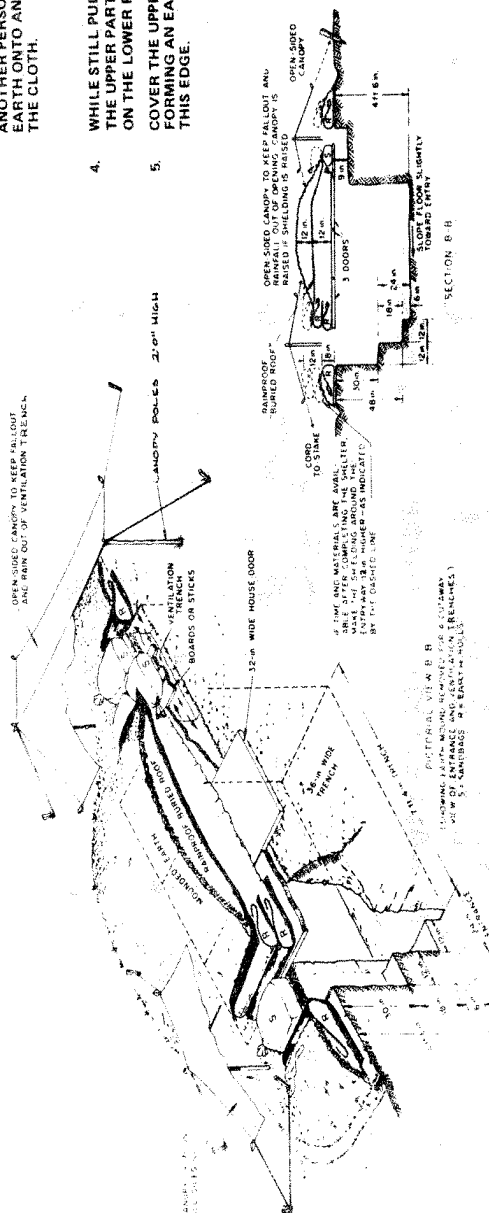
45	-	7'	LONG	4"	DIA.
10	-	5'	"	"	"

THIS SHELTER IS DESIGNED FOR AREAS WHERE THERE IS AN ABUNDANCE OF SMALL TREES AND BELOWGROUND SHELTERS ARE IMPRACTICAL. THE SHELTER (5-PERSON CAPACITY) CAN BE BUILT BY 5 PEOPLE WORKING A TOTAL OF 18-HOURS EACH. READ AND STUDY ALL INSTRUCTIONS BEFORE BEGINNING.

## SECTION THRU COMPLETED SHELTER

# EXPEDIENT FALLOUT SHELTER

## DOOR COVERED TRENCH SHELTER



THIS SHELTER CAN BE CONSTRUCTED IN AREAS WHERE THERE IS AN ABUNDANCE OF SMALL TREES. THE APPROXIMATE AMOUNT OF TIME AND EFFORT REQUIRED TO BUILD THIS SHELTER (CAP FOR 5) IS 5 PERSONS WORKING A TOTAL OF 18 HOURS EACH. READ AND STUDY ALL INSTRUCTIONS BEFORE STARTING TO BUILD.

SAW AND/OR ARE TO CUT TREE POLES.  
SHOVELS ONE FOR EACH TWO WORKERS.  
BAIL HANDS TO CARRY BURNING POTS WITH  
AT LEAST 30 GALLONS STRONG WIRE OR WOOD  
OF ROPE OR 8 DOUBLE-RED SHEETS TO TIE  
WHEN SLOWLY TWISTED TOGETHER AS A ROPE.  
ADDITIONAL PERSON ABOVE A 20 FT OF CLIMB  
TO HOLD THE OTHER END OF THE LINE.  
ROOF MATERIALS ABOVE 2' OF HANG-DROVE  
LABELLED. PLASTIC MATRESS, 6 IN. THICK,  
CLOTH OR PLASTIC AT LEAST AS THING BE USED  
ABOVE 3'. ADDITIONAL SHEETS PER PERSON  
BLANKETS TO PROTECT HANDS FROM INJURY AND  
35 POUNDS OF NEWSPAPER FOR ROOF COVER.

Technical drawing of a rectangular building layout. The overall dimensions are 10' by 12 1/2'. The layout includes a central rectangular area with a dashed line indicating a 'SHELF' and a 'SHELF AREA' of 10' x 10'. The central area is flanked by two side areas, each labeled 'C.B.D.' and '10' x 10'. The top and bottom areas are labeled 'C.B.D.' and '10' x 10'. The left and right areas are labeled 'C.B.D.' and '10' x 10'. The drawing also shows a 'SHELF' area of 10' x 10' and a 'SHELF AREA' of 10' x 10'. The drawing is labeled '10' x 10' and '12 1/2'.

APPROX. NUMBER OF POLES REQ'D.			
28	POLES	12'6" LONG	x 3" DIAMETER
14	"	10'	x 3"
20	"	9'	x 4"
10	"	5'	x 4"
28	"	7'	x 3"
60	"	42"	x 3"
46	"	42"	x 2 1/2" "CORNER BRACES

**SUGGESTED WAY  
OF HAULING POLES**

WATERPROOF MATERIAL  
SLOPED TO DRAIN

EARTH FILLED "HOLE"  
MADE OF GROUT  
AT EDGE OF ROOF.

1ST COVER OF  
NEWSPAPERS OR  
OTHER  
MATERIAL

SHELTER AREA ROOF  
POLES MIN. 8 FT. LENGTH  
& 4 IN. DIAMETER AT SMALL  
END.

3" MIN. DIAMETER SIDE POLES

3/8" DIAMETER BRACE  
CRIB CORNER  
CRIB DETAIL

SELECT A SHELTER LOCATION WHERE THERE IS LITTLE OR NO CHANCE OF THE GROUND BEING COVERED WITH WATER IF IT RAINS HARD. STAKE OUT THE ENTIRE SHELTER, LOCATING THE 5 REQUIRED CRAIBS.

CUT POLES HAVING TOPS WITH DIAMETERS (NOT INCLUDING BARK) NO SMALLER THAN THE DIAMETERS SPECIFIED ON THE ILLUSTRATION FOR EACH TYPE POLE.

SORT THE POLES BY SIZE (LENGTH AND DIAMETER) AND LAY ALL POLES OF EACH SIZE TOGETHER. MEASURE THE LENGTH OF EACH POLE AND SORT SO THAT POLES ARE SMOOTH ON THE SHELTER SITE. CUT OFF ALL LIMBS. POLES CAN BE OBTAINED FOR THE SIDES OF THE SHELTER LONG SINGLE LONG SIDES OF THE SHELTER. USUALLY, THE SHORTER CRIBS ARE BUILT FOR MORE THAN 7 PERSONS (15W-FOOT POLES BEGETH). IT IS BETTER TO USE 2 CRIBS PLACED END-TO-END INSTEAD OF ONE CRIB THAT REQUIRES THE LONGER POLES.

- A. PLACE TWO SIDE POLES ON THE GROUND AND PUT 3 TO 4 ENDS OF ALL POLY ON THE SIDE POLES SO THAT THE ENDS OF ALL POLY ARE IN THE SAME POSITION.
- B. STAKE PAIRS OF END POLES AND SIDE POLES TO MAKE THE CRIBS. KEEP THE TOP POLES ON THE CRIB LEVEL. A TIE GAIN OF 4" TO 6" IS ALLOWED.
- C. PLACE A PAIR OF CRIB AND SMALL ENDS OF THE POLES. THE CRIB SHOULD BE 12" TO 14" LONGER THAN THE CRIB.
- D. THE CORNERS OF THE CRIB BRACE POLES SHOULD BE CUT OFF AT THE TOPS TO WHICH THEY WILL BE TIED.
- E. TIE USING 3" LENGTHS OF TWISTED 1/4" WIDE AND 1/2" THICK LUMBER THINER THAN 2" LUMBER. CRIB BRACE POLES IN POSITION. ONE AGAINST THE OUTSIDE OF CRIB BRACE POLES IN POSITION. ONE AGAINST THE INSIDE OF CRIB BRACE POLES IN POSITION. ONE REMAINING IN THE CRIB PERMANENTLY JUST ABOVE THE GROUND.
- F. PLACE THE CRIB POLY ON CRIB PLASTIC FILM, MAKING SURE ALL POLY IS UNDER THE CRIB. CRIB POLY SHOULD BE CUT OFF AT THE UPPER EDGE OF THE CRIBS TO THE PERMITS TO BE TIED TO THE CRIB BRACE POLES.
- G. THROUGH WHICH TO THE CRIB FIRST CUTTING A SMALL HOLE PERMITS OF CUTTING TOGETHER THE CRIB BRACE POLES USING HORIZONTAL LUMBER CENTER AND TOP CRIB BRACE POLES USING ETC. HAVE BEEN REMOVED FROM WHICH ALL GRASS, ROOTS,

PUT THE 9-FT ROOF POLES IN PLACE. PLACE THE STRONGEST POLES AT THE ENTRYWAY, THEN PLACE THE CENTER 15'0 6" FT. POLES OVER THE ENTRYWAY.

TO KEEP EARTH FROM FALLING BETWEEN THE CRACKS OF THE ROOF, PUT STICKS IN THE LARGER CRACKS AND COVER THE ROOF WITH TWO OR MORE THICKNESSES OF NEWSPAPER OR OTHER MATERIAL.

PUT EARTH COVER ON THE ROOF TO THE DEPTHS SHOWN ON THE ILLUSTRATIONS. BE SURE TO COVER THE HOUNGLOE EARTH SHEDS DOWNWARD TOWARD THE EGGS TO THE HOUNGLOE EARTH SHEDS. USE BEDSTEPS TO FORM "EARTH" HILLS AT THE ROOF EDGE. IF THIS WILL SERVE AS FORMS TO HOLD EARTH IN PLACE, CLUMPS OF EARTH WILL BE PLACED AT ROOF EDGES FOR THE BEDSTEPS. PLACE THE WATER-PROOFING MATERIAL BEFORE PLACING THE FINAL 6 INCHES OF EARTH COVER.

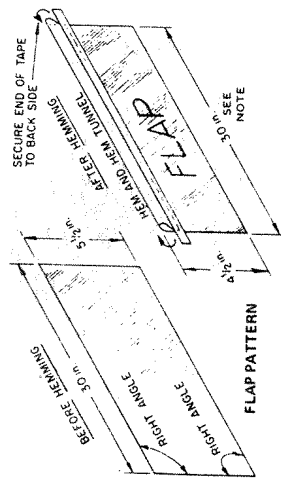
IF THE WEATHER IS WET, BUILD AND INSTALL A SHELTERED VENTILATING PUMP. SEE SEPARATE INSTRUCTIONS ON VENTILATION FOR EXPEDIENT SHELTERS.



## F-9

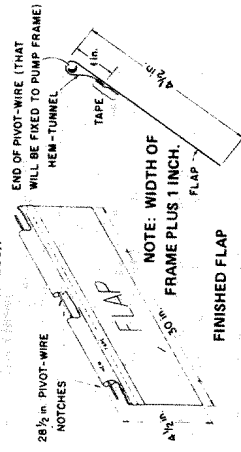
# HOW TO CONSTRUCT THE AIR PUMP (CONT'D)

- C. CUT 10 RECTANGULAR STRIPS 30" LONG BY 5 1/2" WIDE FOR USE AS FLAPS. HEM FLAPS AS SHOWN. USE PRESSURE SENSITIVE TAPE OR SEW HEM SHUT TO FORM HEM TUNNEL.

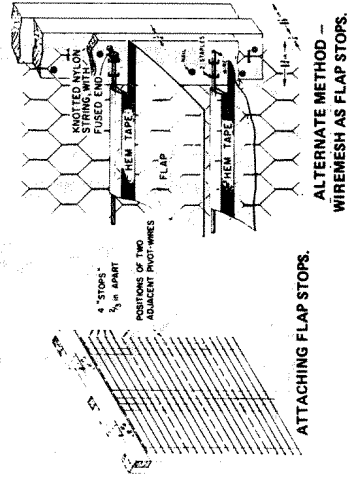


NOTE: WIDTH OF FRAME PLUS 1 INCH

- INSERT 10 PIECES OF STRAIGHT WIRE (PIVOT WIRES) INTO FLAP HEM AS SHOWN. FLAPS SHOULD SWING FREELY. STRING CAN BE USED IF WIRE NOT AVAILABLE (WIRE COAT-HANGER THICKNESS).



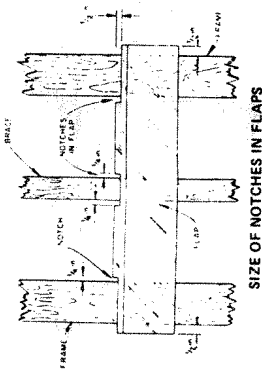
- E. ATTACH FLAP STOPS (STRINGS OR WIRES) TO THE PUMP FRAME AT THE MARKED LOCATIONS. 4 FLAP STOPS ARE NEEDED BETWEEN ADJACENT PIVOT WIRES



ATTACHING FLAP STOPS.

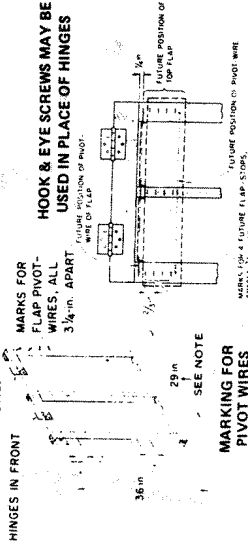
ALTERNATE METHOD - WIREMESH AS FLAP STOPS.

- AFTER HEM IS MADE, CUT NOTCHES IN FLAPS AS SHOWN. AVOID CUTTING TAPE THAT HOLDS HEM.



SIZE OF NOTCHES IN FLAPS

- D. MARK PUMP FRAME FOR PIVOT WIRE AND FLAP STOP LOCATIONS.

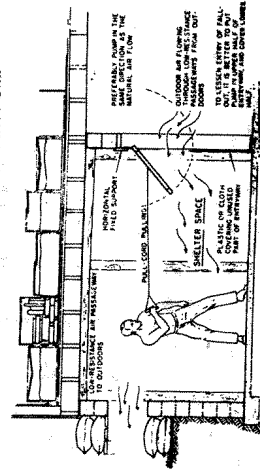


MARKING FOR FLAP STOPS.

NOTE: FRAME DIMENSIONS MAY HAVE TO BE ADJUSTED TO FIT OPENING IN SHELTER

- F. STARTING FROM THE BOTTOM - STAPLE, NAIL, TACK OR TIE THE FLAP PIVOT WIRES WITH FLAPS IN THEIR MARKED POSITIONS. ATTACH HINGES TO HORIZONTAL SUPPORT BOARD. ATTACH PULLCORD TO CENTER BRACE.

## STEP 4. TYPICAL INSTALLATION OF AIR PUMP



## BUCKET STOVE

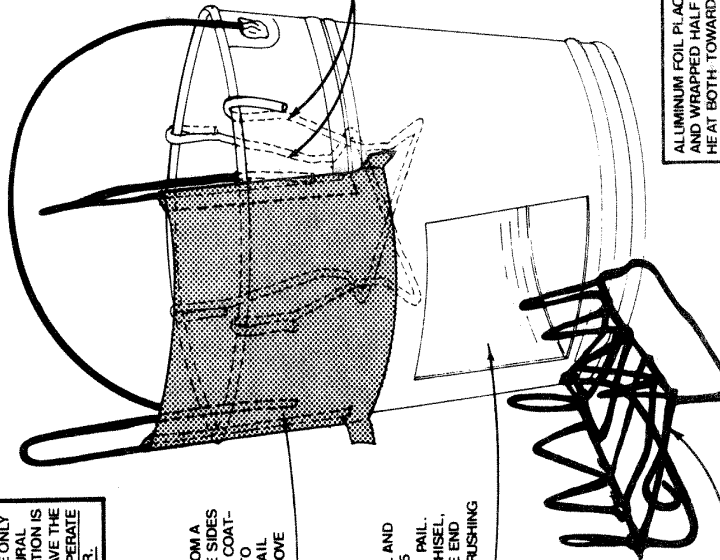
THIS COMBINATION COOK-STOVE/SPACE HEATER IS MADE USING A 10 TO 16 qt. METAL PAIL, SOME COAT-HANGER WIRE, AND METAL CUT FROM A LARGE JUICE OR VEGETABLE CAN. WHEN ASSEMBLED AS SHOWN, THE STOVE WILL BRING 3 qts. OF WATER TO A BOIL USING AS FUEL ABOUT 1/2 lb. OF DRY, TWISTED PAPER OR DRY WOOD. PIECES OF WOOD ABOUT 1/2 x 3/4 x 6 INCHES ARE BEST.

**NOTE:**  
LOCATE COOK-STOVE ONLY WHERE EITHER NATURAL OR FORCED VENTILATION IS CAUSING AIR TO LEAVE THE SHELTER—DO NOT OPERATE IN A SEALED SHELTER.

CUT THE DAMPER FROM A JUICE CAN. BEND THE SIDES WITH PLIERS AROUND COAT-HANGER WIRE USED TO ATTACH DAMPER TO PAIL. THIS ALLOWS IT TO MOVE UP AND DOWN.

USING A COLD CHISEL AND TIN SNIPS, CUT A 5 x 5 SQUARE HOLE IN THE PAIL. WHEN USING COLD CHISEL, PLACE PAIL OVER THE END OF A LOG TO AVOID CRUSHING THE PAIL.

USE 4 OR 5 METAL COAT HANGERS TO FASHION A GRATE AS SHOWN

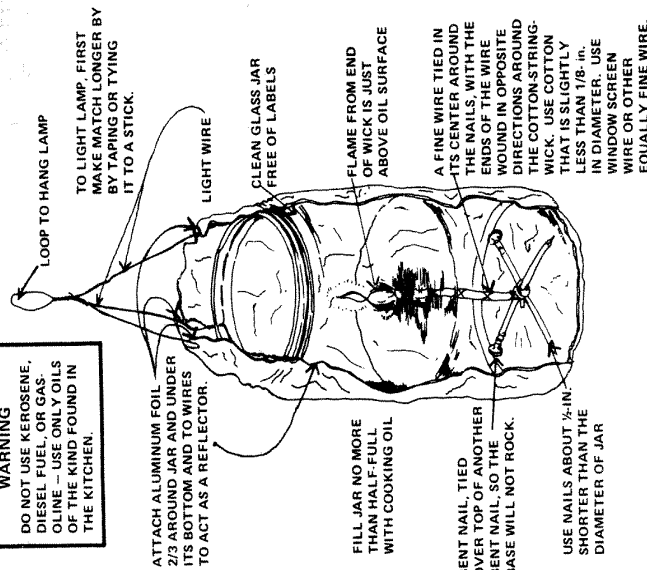


ALUMINUM FOIL PLACED IN BOTTOM OF PAIL AND WRAPPED HALF WAY AROUND IT REFLECTS HEAT BOTH TOWARD COOK-POT AND TOWARD SHELTER AREA WHEN DEVICE IS USED AS A SPACE HEATER.

## EMERGENCY LAMP

THIS TYPE OF LAMP WILL PROVIDE LIGHT FOR USE IN EXPEDIENT SHELTERS — THE LAMP WILL BURN SLOWLY CONSUMING ABOUT 3 OUNCES OF COOKING OIL IN 24 HOURS.

**WARNING**  
DO NOT USE KEROSENE, DIESEL FUEL, OR GAS. OIL — USE ONLY OILS OF THE KIND FOUND IN THE KITCHEN.



WIRE-STIFFENED WICK LAMP

KEEP EXTRA WIRE AND WICK-STRING IN SHELTER.